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AUTUMN ISSUE
OF
THE IRONMONGER
UNIVERSAL ENGINEER
AND
METAL TRADES ADVERTISER

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CROGGON & Co LTD
IRON & ZINC MERCHANTS,
FELT, TANK & CISTERN MAKERS &c.
LONDON, LIVERPOOL, GLASGOW.

F. BRABY & Co.
LONDON, 352 TO 362 EUSTON Rd | LIVERPOOL, 6 & 8 HATTON GARDEN | GLASGOW, PETERSHILL ROAD.
SHEET ZINC
PERFORATED ZINC.
SMOKY CHIMNEY CURES.
TELEGRAPHIC ADDRESS—"COURTEOUS LONDON."
FOR DESIGNS & PRICES SEE PAGES 176 TO 187 OF OUR No. 10 ILLUSTRATED CATALOGUE

Index to Advertisements pp. 35 to 38. Trade Marks Section between pp. 32 and 33

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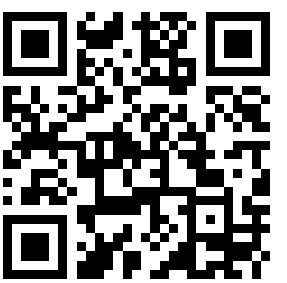


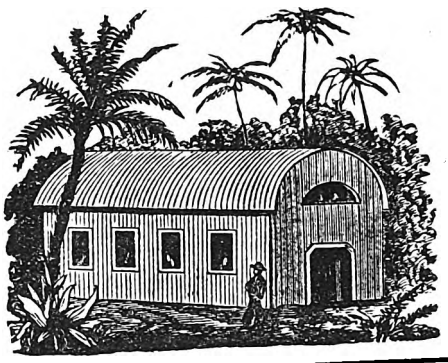
THE BLACKWALL GALVANIZED IRON CO., LIMITED.

Offices—
CORBET COURT, LONDON, E.C.

Works—
ORCHARD PLACE, BLACKWALL.

BEST GALVANIZED CORRUGATED AND WORKING-UP SHEETS

Fancy Small Corrugated Iron for Verandahs, Poultry Houses, &c.



The Company GALVANIZE every description of Ironwork on the shortest notice.

LARGEST Baths in the trade for Tanks, &c., of exceptional dimensions.

STEEL FORGINGS | PATENT ROLLED SHAFTING

THE CARBROOK FORGE & STEEL CO., SHEFFIELD.

Telegrams—"Hodgkinson Sheffield." Sheffield Telephone Exchange. No. 35. National Telephone, No. 35.

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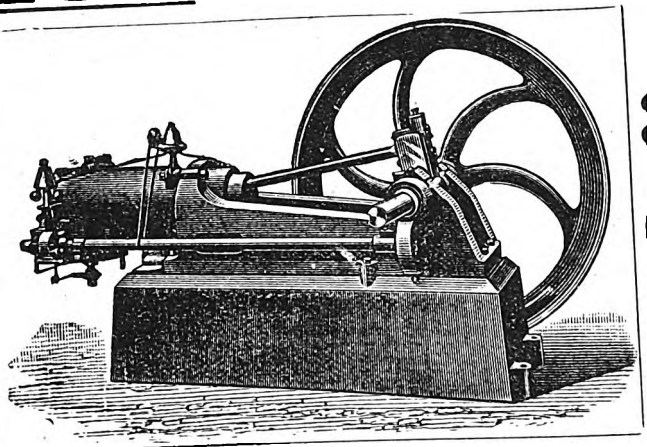
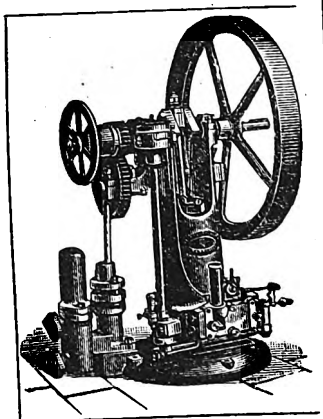
100 PRIZE MEDALS.

SIZES from 2-man power to 100 h.p. indicated.



REPRESENTS APPROXIMATELY FROM 2 TO 14 H.P.

OVER 31,000 OF THE 'OTTO' PATENT WORKING.



SMALL VERTICAL ENGINE AND PUMP COMBINED.

Large Engines and Dowson Gas-work, for a consumption of 1½ lbs. of Coke converted into Gas per h.p. per hour.

CROSSLEY BROS.

OPENSHAW, MANCHESTER,

LONDON, GLASGOW, NEWCASTLE, LIVERPOOL, HULL, BIRMINGHAM.

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RODGERS' PULLEYS.

(REGISTERED.)

HIGHEST AWARD AT INTERNATIONAL INVENTIONS EXHIBITION, LONDON.

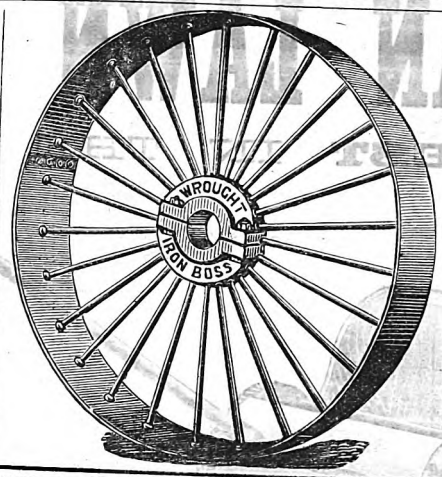
WROUGHT IRON THROUGHOUT, RIM, ARMS, AND BOSS.

80,000

IN USE.

Quick Delivery Guaranteed.

THE ONLY PULLEY MADE WITH A WROUGHT-IRON BOSS.



The LIGHTEST, STRONGEST, SAFEST, AND BEST BALANCED PULLEY MADE.

80,000

IN USE.

Price Lists, &c., on application.

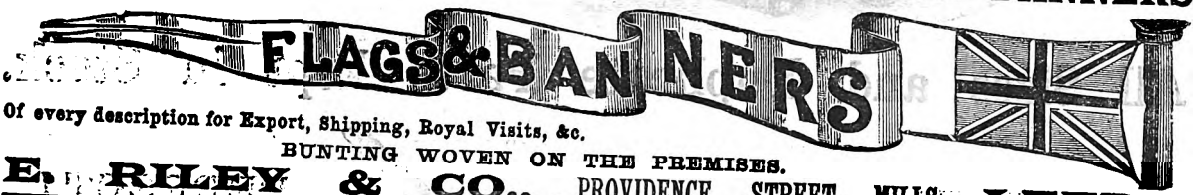
SOLE MAKERS—

HUDSWELL, CLARKE & CO.

RAILWAY FOUNDRY, LEEDS.

GENUINE MANUFACTURERS OF

PATTERN-DYED AND SEWN FLAGS AND BANNERS



Of every description for Export, Shipping, Royal Visits, &c.

BUNTING WOVEN ON THE PREMISES.

E. RILEY & CO., PROVIDENCE STREET MILLS, **LEEDS.**

PATENT LETTER & ENAMEL CO., LIM.

(UNDER ROYAL LETTERS PATENT)

MANUFACTURERS OF

ENAMELLED LETTERS, SIGNS, TRADE MARKS, DEVICES, AUTOGRAPHS, ETC.

For all kinds of Advertisements, Facias, Shop Windows, &c., &c.

Can be affixed on Glass, Stone, Iron, Zinc, Tin, Brass, or Wood.

They will NOT FALL OFF, but can be easily removed.

Every size, style, or colour made to order; also **SCRIPT SIGNS**, &c., &c. These Letters are far superior to anything yet introduced, as all in the Trade admit. They are brilliant in colour, cheap in price, show day and night, lay close to the surface, and do not interfere with cleaning.

Head Office and Showrooms—144 HIGH HOLBORN, LONDON, W.C.

Factory and Workshops—RAY ST., CLERKENWELL, LONDON, E.C.

Branches: GLASGOW—Central Arcade. MANCHESTER—Victoria Station Approach.

N.B.—A responsible Wholesale Agent wanted in every City on the Continent; also in India, China, Australia, and New Zealand, where not at present represented.

PRICE LISTS, ILLUSTRATED SHEETS, ESTIMATES, AND DESIGNS FREE.

JOHN EDDOWES, General Manager.

A

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HARTSHORN'S SELF-ACTING SHADE ROLLERS.

HARTSHORN'S SELF ACTING SHADE OR BLIND ROLLERS

QUICKLY CARRIES THE BLIND TO THE DESIRED POSITION ON WINDOW.

EVERY GENUINE ROLLER HAS THE NAME OF MANUFACTURER STEWART HARTSHORN IN SCRIPT ON ROLLER.

NO CORDS OR BALANCES.

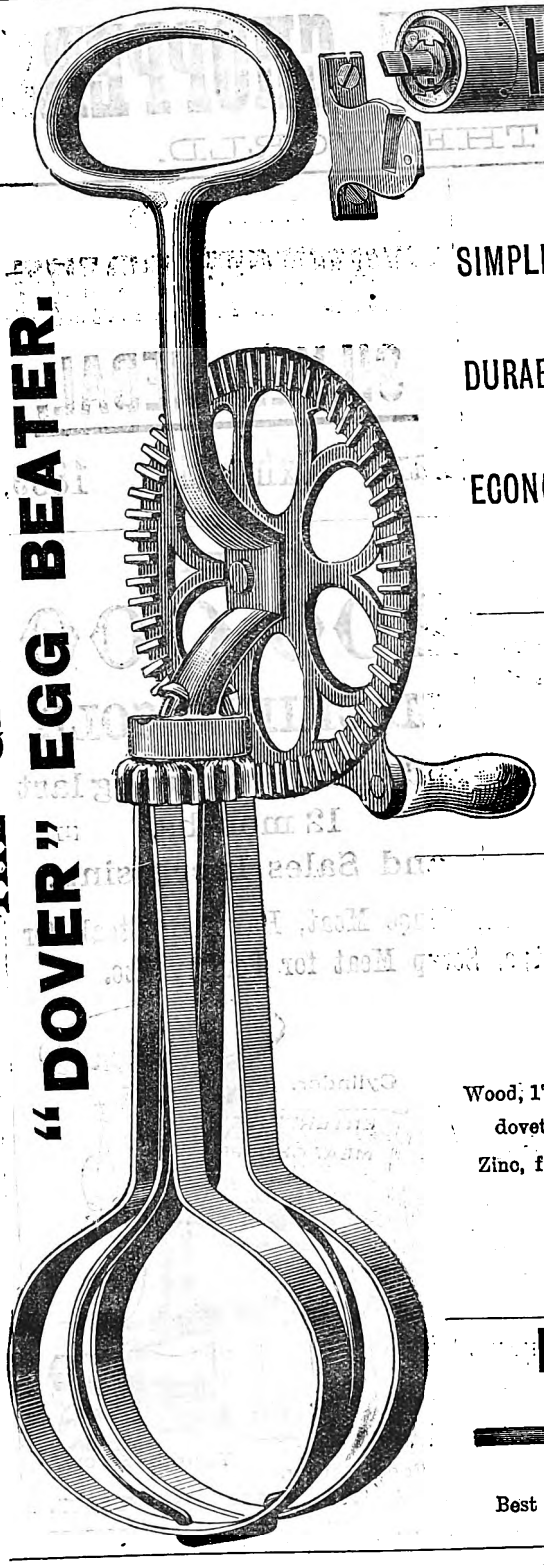
SIMPLICITY

DURABILITY

ECONOMY

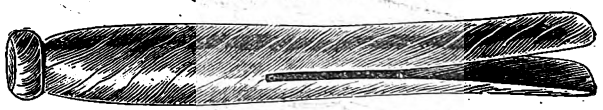
IMITATIONS HAVE BEEN ATTEMPTED, AVOID THEM

THE GENUINE "DOVER" EGG BEATER.



CLOTHES PEGS

(BEST QUALITY.)

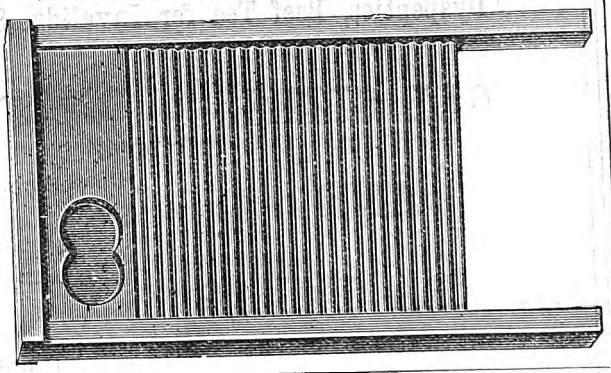


Full count. Five gross in each box.

WASH BOARDS

(GENUINE AMERICAN.)

Wood, 17 inches, dovetailed.
Zinc, full size.



BROOM HANDLES

(WHITEST SPRUCE.)

50 × 1⅛ inches, in bundles containing 1 gross.
Best Quality (the very best imported), per gross. No. 2 Quality, per gross.
NOTE.—*Each Bundle is covered with strong Canvas.*

Our New Illustrated Catalogue, Price List, and Trade Terms will be sent on application to

JOHN G. ROLLINS & CO., LIM.

AMERICAN MERCHANTS AND FACTORS

OLD SWAN WHARF, LONDON BRIDGE, LONDON, E.C.

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ESTABLISHED 1833.

F. McNEILL & CO.

BUNHILL ROW, LONDON.

Manufacturers and ORIGINAL Patentees of

ROOFING, SARKING, SHEATHING, & INODOROUS FELTS.

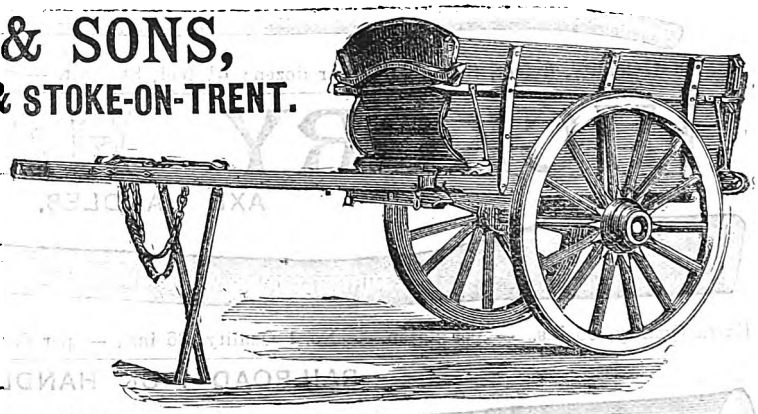
FOUNDATION FELTS FOR DAMP COURSE.

HAIR FELT FOR BOILERS AND STEAM PIPES.

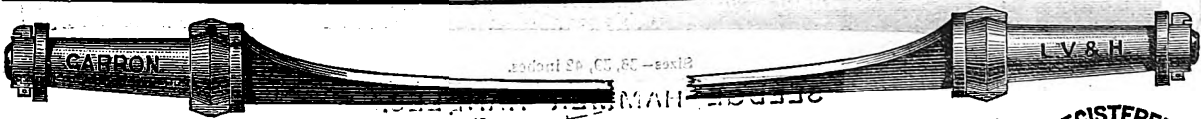
Contractors to Her Majesty's Government and Military Camps.

JOHN SMITH & SONS,

Steam Wheelwright Works, WOLVERHAMPTON & STOKE-ON-TRENT.



Barrows and Hand-Carts of all kinds.
Brewers' Floats, Drays and Wagons.
Sack Trucks.
Builders' and Contractors' Plant.
Timber Carriages.
Cart and Wagon Waterproof Covers.
Improved Tumbler Carts.
Parcel Carts and Vans.
Railway Lorries, Vans, &c.
Sanitary Carts and Vans.
Springs and Axles of every description.
Water Carts and Improved Hydrostatic Vans.
Wheels of all kinds made by Patent Machinery. [6]



REGISTERED AXLE BRAND.

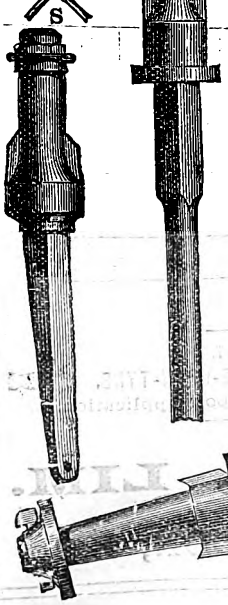
LONES, VERNON & HOLDEN,

REGISTERED IRON BRAND

L.V.&.H.

SANDWELL IRON AND AXLE WORKS,

SMETHWICK, ENGLAND,



MANUFACTURERS OF

PATENT COLLINGS, MAIL, SHORT BOLT MAIL AXLETREES.

Screwed End Arms with Iron Nut and Linch Pin.

OMNIBUS & CAB AXLES,

CART & WAGON ARMS, DRABBLE'S PATENT VAN ARMS, AUSTRALIAN & WEST INDIAN DRAY AXLES, & AMERICAN PATTERN BUGGY AXLES;

ALSO MANUFACTURERS OF

Merchant Bars, Rounds, Flats, Tees, Channel, Angles, Ovals, Square Edge & Feather Edge Half Rounds,

SPECIAL RIVET IRON.

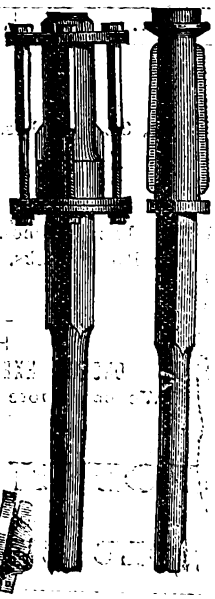
REGISTERED AXLE BRAND. W. ORME

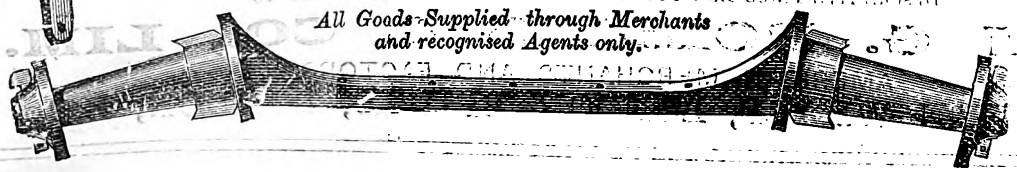
REGISTERED AXLE BRAND. J. McEWEN

Best Best Best, and Treble Best Qualities Imitation Swedish Iron.

SPECIAL SPOKES for RAILWAY WAGON WHEELS.

All Goods Supplied through Merchants and recognised Agents only.





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THE "WELLS LIGHT"

WALLWORK & WELLS' PATENTS. PATENTED ABROAD.

Light up to 4,000 Candles from Oil.

CONTINUOUS, as the Lamps can be recharged with Air or Oil whilst burning.

OVER 3,000 SOLD IN 2 SEASONS ONLY.

ONE OF THE MOST SUCCESSFUL INVENTIONS EVER INTRODUCED.

FIG. 1.

Group representing three Standard Sizes of Lamps.

INVALUABLE IN ALL COUNTRIES

For Engineers, Foundries, Iron and Steel Works, Railway Companies, Dock-yards, Shipbuilders, and Contractors, and all large outside work.

Over 400

of these Lamps are in use on the MANCHESTER SHIP CANAL workings, where no other artificial light is used.

ABSOLUTELY PORTABLE AND SELF-CONTAINED.

Requires no Engine, Air Compressor, or Boiler to drive it, *as others do.*

Can be carried about by two boys.

BEWARE

of unworked-out imitations which are already being passed off as our Lamp, owing to its great success. The small details of the Lamps which are all patented have taken years to perfect, and the great sales show how the Light has been approved of.

No. 1, new pattern, with one handle. Can be easily carried about whilst burning by one boy; giving a light up to 500 Candles, **£10 0 0**, burning ½ gallon per hour.

No. 2, giving a light up to about 1,500 Candles, **£15 10 0**, burning ¾ gallon per hour.
(Manchester Ship Canal Pattern)

No. 3, giving a light up to about 2,500 „ **£16 10 0** „ 1¼ „ „
(Manchester Ship Canal Pattern)

No. 4, giving a light up to about 3,500 „ **£17 15 0** „ 2 „ „

Separate burners—of which it is always advisable to have one extra with each lamp—For No. 1 lamp, **£1 8s.**; for No. 2, **£1 10s.**; for No. 3, **£1 15s.**; for No. 4, **£2.**

We supply the "Wells Oil," which is refined from Coal Tar, for use in these Lamps. If the distance is too great to export this Oil, which is not Explosive or Inflammable, we arrange the Burners to use ordinary refined Petroleum or Kerosene, obtainable in every country, the consumption being the same as with our Oil. Correspondents are invited to send us particulars of their Oil supply, with information as to its Prices and Import Duties.

THE LAMPS WILL NOT BURN VEGETABLE OR GREASY OILS.

A. C. WELLS & CO., 103 MIDLAND RD., ST. PANCRAS, **LONDON.** Branch Depot— Carnarvon St., CHEETHAM, **MANCHESTER.**

LIST OF HOME DISTRICT AGENTS ON APPLICATION.

FOREIGN AGENTS.—PARIS: L. Roffo, 58 Boulevard Richard Lenoir. ROTTERDAM: Wynmalen & Hausmaun.
MOSCOW and ST. PETERSBURG: John Block. SYDNEY: John Shaw & Sons (Limited).
HAMBURG: Sd. Grube, Albertstrasse 9, Licensed Manufacturer (Registered Title, "Oleovapor Licht").
NEW YORK: Keegan & Halpin, 46 Washington Street, Licensed Manufacturers.
MONTREAL: James Cooper, St. James Street, Licensed Manufacturer.
TURIN: Ing. Vittorio Croizat, via Gioberti 18. HONG KONG and SHANGHAI: Lane, Crawford & Co.

A few good Engineering Merchants abroad required to take up the Agency for these Lamps where this has not been already arranged.

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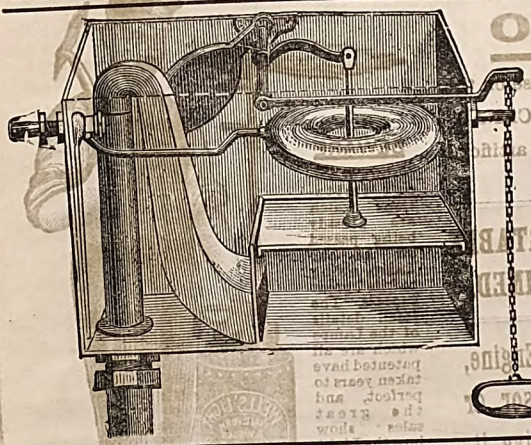
GOLD MEDAL, PARIS, 1889.
FIRST AWARD, MELBOURNE, 1888.
PRIZE MEDALS, Society of Architects, LONDON, 1886 & 1887.

PATENT TUBULAR REVERSIBLE
THE TUBULAR LOCK SYNDICATE LONDON.

THE COMING LOCK.
Machine-made throughout
THE CELEBRATED PATENT
TUBULAR REVERSIBLE LOCK.
Works with 2 Handles, 1 Handle or no Handles

Instantly inserted by one Tool—a Screw Bit.
Every requirement completely fulfilled
For Particulars, Prices & Address:—
THE TUBULAR LOCK SYNDICATE,
Leadenhall Buildings,
LONDON, E.C.

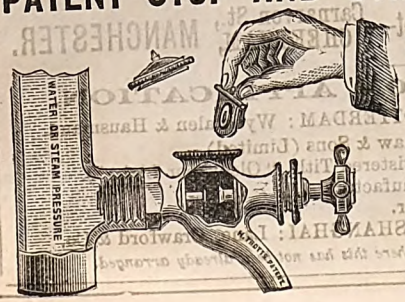


PATENT
VALVELESS SYPHON WATER WASTE PREVENTER.
ABSOLUTELY NOISELESS IN ACTION.
ALWAYS RELIABLE.
Stamped by the New River Company.
A. EMANUEL & SONS, Ld.
MARYLEBONE LANE, LONDON.
Telegrams "EMANUEL LONDON."

ENAMELLED IRON.
The Glasgow Porcelain Enamel Co.
Enamellers to the Trade of all kinds of
SANITARY-WARE.
170 ST. JAMES' ST., KINNING PARK, GLASGOW.

PORCELAIN ENAMELLED CAST IRON
BATHS
LAVATORIES, SINKS, URINALS, MANGERS, &c., &c.
PLATES FOR ADVERTISING SIGNS, AND ALL PURPOSES.
ARTISTIC. PERMANENT. ECONOMICAL.

H. TROTT
PATENTEE AND MANUFACTURER OF
PATENT STOP AND OTHER VALVES (FULL WAY)
FOR
STEAM, HOT AND COLD WATER,
Fire Valves, Self-closing Taps,
Ball Valves, Filter Taps, &c.
Fitted with Renewable Seatings and Inner Valves.
PATENTED ALSO ABROAD.
OVER 16,000 HAVE BEEN SOLD.
In these Valves the Seatings can be renewed without removing or breaking the Pipe Joints.
PRICES ON APPLICATION AT THE WORKS.
75, 77, 79 High St., Battersea, LONDON, S.W.



Latest Patented Improved Non-concussive Self-closing Valves. A Great Success!

Showing Movable Valve while under Pressure.

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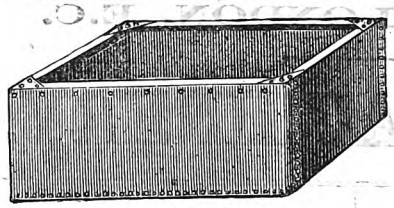
JOHN BELLAMY

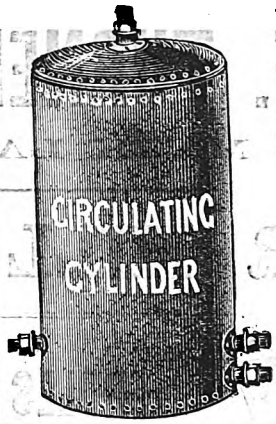
BYNG STREET, MILLWALL, LONDON, E.

WROUGHT-IRON TANKS & CISTERNS



Cattle Troughs, Girders, Cart Bodies, &c.

Omnibus from West India Dock Station passes Byng St.



W. B. BAWN & CO.

Manufacturers of

GALVANIZED IRON

CISTERNS, TANKS, CYLINDERS,

TROUGHS, CORN BINS,

&c., &c.

Telegraphic Address—

"LANCASTER BAWN LONDON."

Works—

West India Dock Road,

LONDON, E.

HENRY SHAW & SONS, Park St., BIRMINGHAM

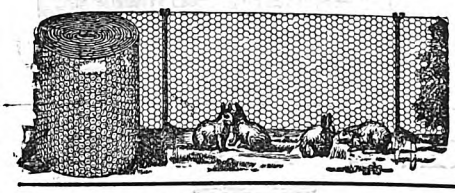
(ESTABLISHED 1799)

NAIL, CHAIN, AND RIVET MANUFACTURERS.

SOLE AGENTS FOR "RIFLE BRAND" BRIGHT-POINTED HORSE NAILS

GALVANIZERS.

OUR SPECIALITY



GALVANIZED

WIRE NETTING.

BOULTON & PAUL, Makers, NORWICH, ENGLAND.

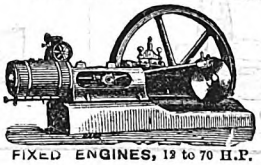
MARSHALL, SONS & CO., LIMITED,

Britannia Works, Gainsborough.

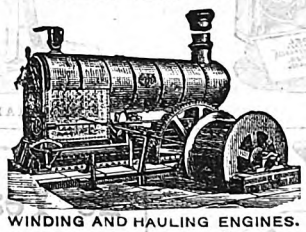
Address for Telegrams—"MARSHALLS GAINSBORO."

Over **18,000 ENGINES** Made and Supplied.

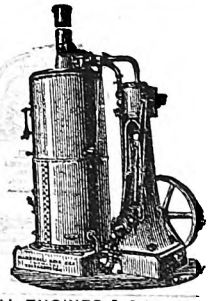
Portable and Semi-Portable ENGINES.



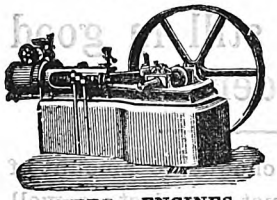
FIXED ENGINES, 12 to 70 H.P.



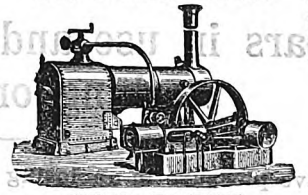
WINDING AND HAULING ENGINES.



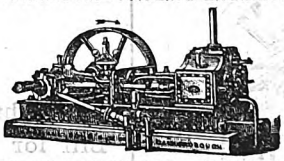
VERTICAL ENGINES & BOILER.



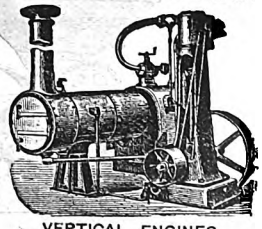
FIXED ENGINES
4 to 12 H.P. Nominal.



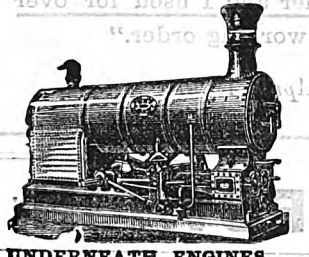
FIXED ENGINES
With Loco. Boilers.



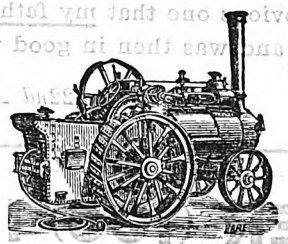
DOUBLE-CYLINDER ENGINES
High Pressure or Co pound.



VERTICAL ENGINES
With Loco. Boilers.

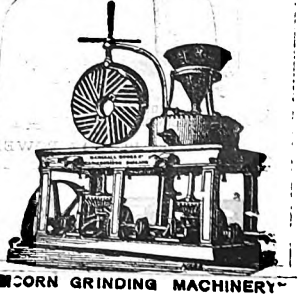


UNDERNEATH ENGINES
High Pressure or Compound.



TRACTION ENGINES.

THRESHING MACHINERY
all Countries.



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NEW CATALOGUES with Current Prices Free on Application.

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SAMUELSON & CO., LIMITED,

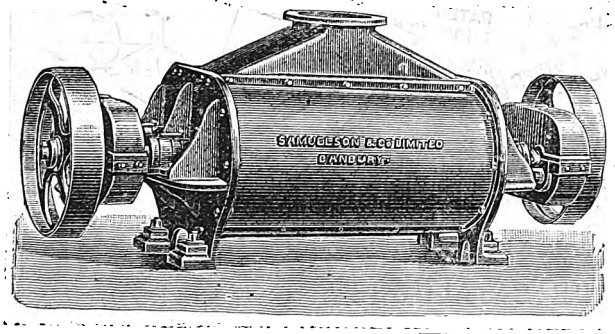
Sole Licensees for Manufacture in the United Kingdom of

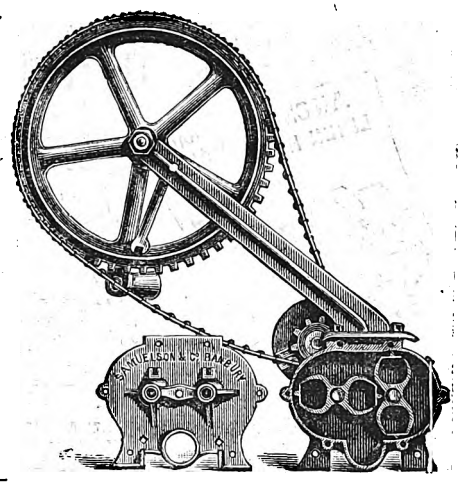
ROOTS' "ACME" BLOWERS

AND EXHAUSTERS.

FITTED WITH IRON REVOLVERS, ABSOLUTELY POSITIVE IN ACTION.

SUPPLIED TO H.M. INDIAN GOVERNMENT.





The following are some of the uses for which the Roots' Blower is adapted:—

For Smiths' Fires.
For Iron Foundries and Cupolas.
For Drying Timber, Fibrous Materials, &c.
For Removing Dust from Cutlery Works, Emery Wheels, Grindstones; for Exhausting Fumes, Smoke, and Offensive Odours.
For Ventilating Mines, Tunnels, Public Buildings, Water Closets in large Hotels, Factories, Asylums, &c.
For Cooling Chambers for Storage of Meat and other perishable articles.
For Pneumatic Despatch
For Blowing Boiler Furnaces and Ventilating Steamships.
For Use in Chemical Works, Sugar Refineries, Soda Manufactories.
For Smelting Lead and Copper Ores.
For any purpose where Fans are used for Blowing or Exhausting.

TO ENGINEERS AND IRONFOUNDERS.

WOOLNOUGH AND DEHNE'S

PATENT MOULDING MACHINE FOR PLATE & DIE MOULDING,

With SAMUELSON & CO.S RECENT IMPROVEMENTS, including Self-Adjusting Table to suit ordinary Moulding Boxes.

LABOUR SAVING, AND RAPIDLY PRODUCING HIGHLY FINISHED AND VERY ACCURATE WORK.

SUPPLIED TO THE SOUTH AUSTRALIAN GOVERNMENT, &c.

SAMUELSON & CO., LIMITED,

ENGINEERS,

BANBURY, OXFORDSHIRE, ENGLAND.

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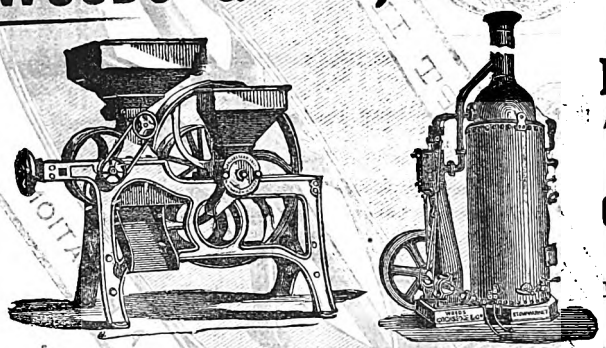
WOODS & CO., Suffolk Iron Works, STOWMARKET.



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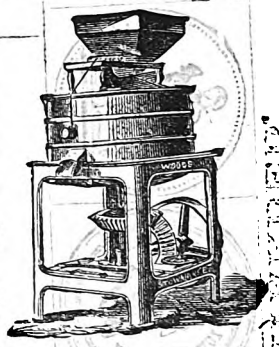
HORSE GEARS.

Stock-Feeding Machinery, all kinds.

CELEBRATED PRIZE CARTS & WAGGONS.

Deep Well Pumps, all Sizes.

Liberal Discounts to Trade and Shippers. Apply for Catalogues.



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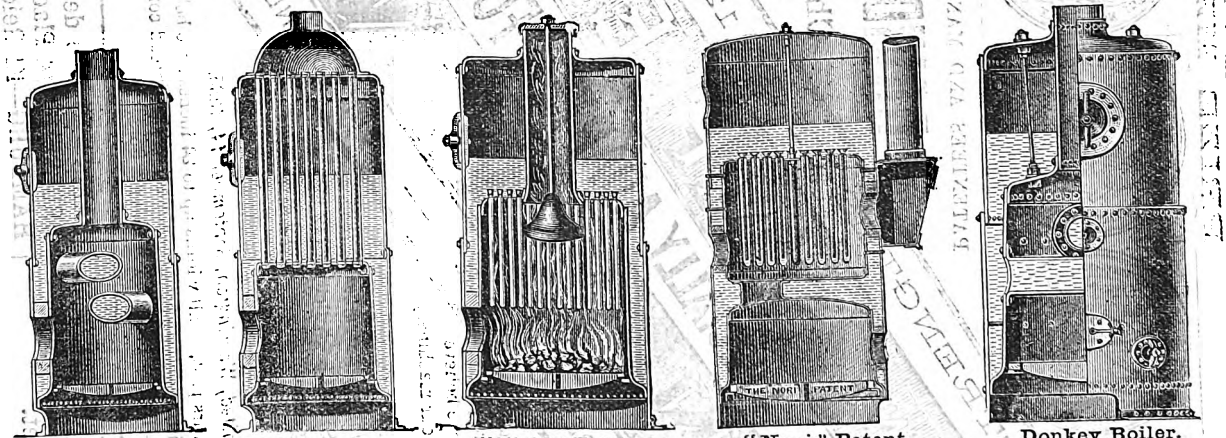
THE GRANTHAM CRANK & IRON CO. LIM.

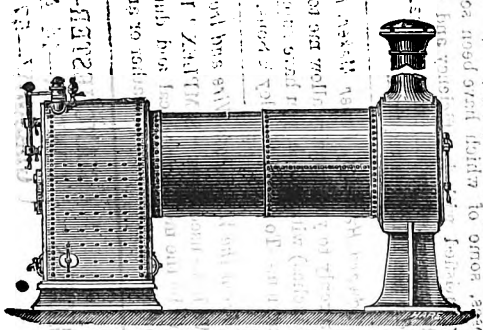
GRANTHAM.



Cross Tube. Multitubular. "Field" Tube. "Novi" Patent. Donkey Boiler.

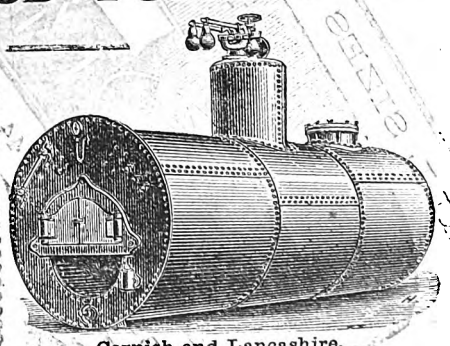
STEAM BOILERS OF ALL KINDS AND SIZES

FOR COAL AND WOOD FUEL.



Semi-Portable.

Boilers made of Best Mild Steel Plates, a speciality of the Grantham Crank and Iron Co., Limited.



Cornish and Lancashire.

LIBERAL TERMS TO THE TRADE AND SHIPPERS.

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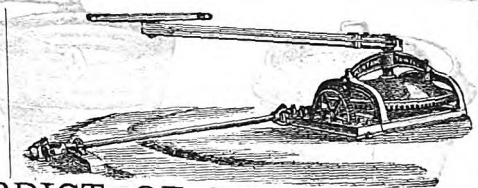
Acknowledged by all to be the Leading Gears in the Trade.



Indents should specify R. Hunt & Co.'s Manufacture.

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"FIRST ORDERS OF MERIT,"

SYDNEY, 1879-80; MELBOURNE, 1880-1; ADELAIDE, 1887. No other Gears have achieved such unrivalled success.

Further Confirmation:—First Class Award and Special Mention, MELBOURNE, 1888-9.

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R. H. & CO. ALSO MANUFACTURE

CHAFF CUTTERS, MILLS FOR CRUSHING, KIBBLING, or GRINDING CORN, AND ALL KINDS OF AGRICULTURAL MACHINERY.

SHAFTING, PULLEYS, PLUMMER BLOCKS, &c.

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SAUSAGE CHOPPING MACHINES & FILLERS,

FOR MANUAL, GAS, or STEAM POWER,

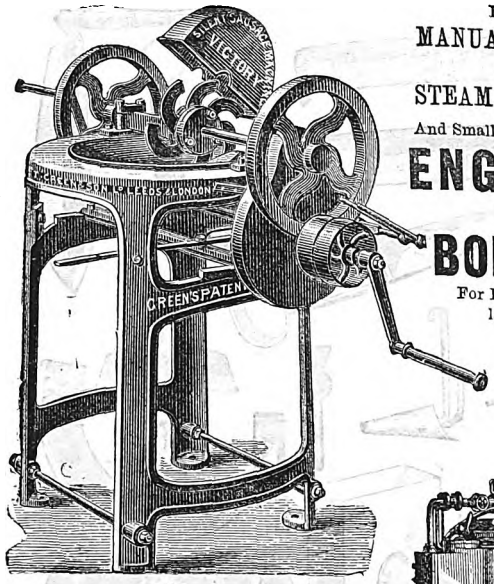
And Small Gas or Steam

ENGINES

AND

BOILERS

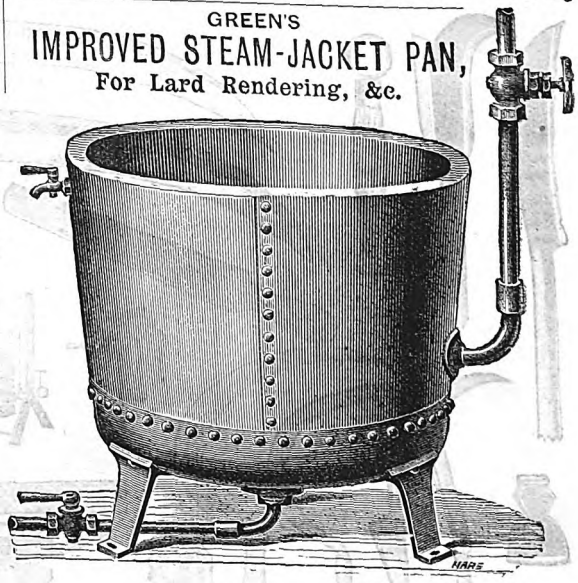
For Driving the large sizes by Power.

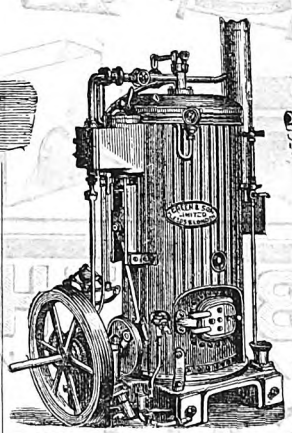


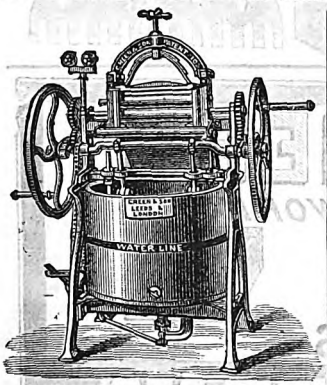
GREEN'S

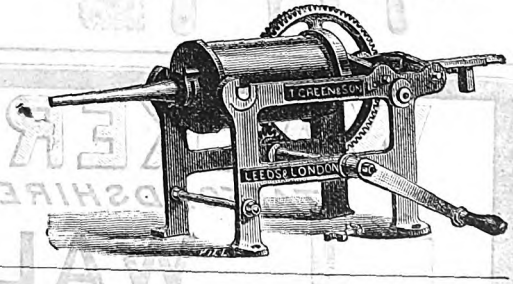
IMPROVED STEAM-JACKET PAN,

For Lard Rendering, &c.









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Washing, Wringing, & Mangling Machines, & all Laundry Requisites.

They can be had of all respectable Ironmongers in the United Kingdom, or direct from

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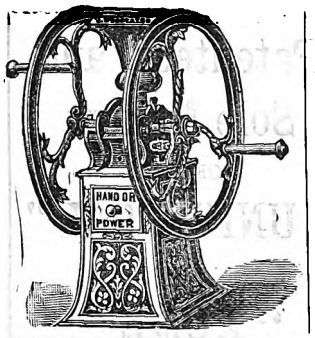

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(Upwards of 20 years with the late Zachariah Parkes, and principal workman several years previous to his death),

MANUFACTURER OF

Steel Mills—Coffee, Cocoa, Corn, Wheat, Paint, and Bean Splitters, &c.

Superior workmanship guaranteed. Write for Price List, Illustrations, and Testimonials from the largest grinders in England.

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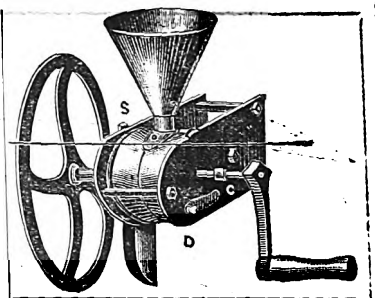
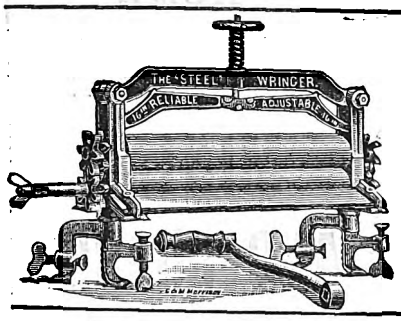


All Mills proved and tested by myself before leaving the works.



STEEL WRINGERS—UNBREAKABLE

Sewing Machines for all purposes:

DOMESTIC, TAILORING, SACKS, SAILS, TARPAULINS, AND BELTS.

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GENUINE EMERY,
EMERY CLOTH,
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BOSTON, 1883.
LONDON, 1884.

"WELLINGTON" GENUINE EMERY WHEELS

FOR

Fettling Iron Castings, Grinding Metals and Tools, Sharpening Saws, &c.

WELLINGTON EMERY AND BLACKLEAD MILLS, WESTMINSTER BRIDGE ROAD, LONDON, S.E.

Awarded to SAYNOR, COOKE & RIDAL (ESTABLISHED 1738.), Paxton Works, SHEFFIELD, ENGLAND.

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Manufacturer of Wire, Hair, Lawn, Tammy, Cyprus, and Drum Sieves; also Screens suitable for every trade purpose. Repairs promptly executed. Wire Gauze in all Metals, Plain and Ornamental Wire Work, White Enamelled and Gold (Registered) and other Birdcages and Aviaries, Watson's Patent Ventilating Cowl, Watson's Patent Gas Stove, Southon's Patent Gipsy Jacket for Speed and Economy in heating Kettles, Saucepans, &c., Patent Reversible Toaster, &c., &c. Patent Collapsible Crate for all purposes.

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LOCKS AND LATCHES

IN GREAT VARIETY, viz:

Rim and Mortice Knob Locks, Dead Locks, Drawback Locks, Shop Door Locks and Latches; also a good selection of Padlocks, Cupboard, Drawer, and Cabinet Locks.

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Of Modern & Antique Designs,

Including Letter Plates, Knockers, Bar Handles, Pull-to Knobs, Finger Plates, Lever Handles, and a large line of Builders' Hardware.

PRESS BUTTONS FOR ELECTRIC BELLS AND DOOR GONGS.

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WINDOW FRAME PULLEYS

AND SCREW PULLEYS,

Shutter Bars and Sash Fasteners, Fanlight Openers and Sash Lifts; Hat and Coat, Wardrobe, Harness, Hammock, and Bird-Cage Hooks.

SHELF & FLOWER POT BRACKETS,

IN PLAIN AND FANCY DESIGNS.

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TOOLS OF BEST AMERICAN MANUFACTURE,

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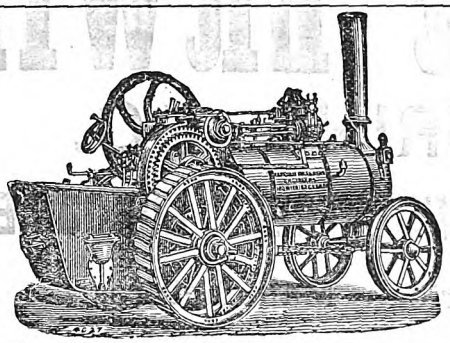
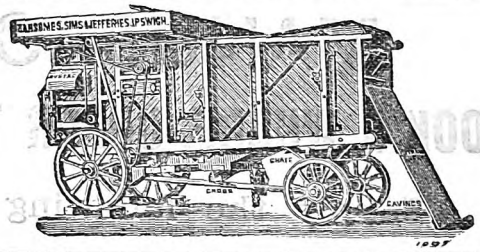
THE BEST STEAM THRASHING MACHINERY.



R. S. & J. have supplied Thrashing Machines to HER MAJESTY THE QUEEN and H.R.H. THE PRINCE OF WALES.



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INVITE THE SPECIAL ATTENTION OF PURCHASERS TO THEIR

PORTABLE AND TRACTION ENGINES, which are of entirely new design and construction, with large Lowmoor fire-boxes, large steam-jacketed cylinders, wrought-iron adjustable brackets for crank-shaft, new high speed, double-beat, piston valve-governor giving complete control over Engine. These Engines will give off nearly three times their nominal power.

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POWELL BROTHERS & WHITAKER,
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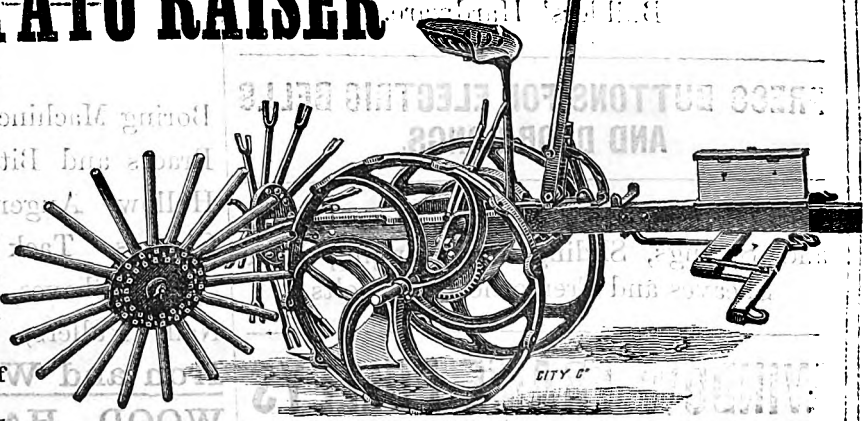
PATENT POTATO RAISER



An Improved Fork Wheel. —The Fork Wheel is of a cone shape, with Forks set on an angle, so as to work under the ridge, thus leaving more soil behind the Machine to work with less power than when spread with an ordinary straight wheel, and is less liable to cover the Potatoes. **A New Revolving Wheel or Cratch.** The Driving Wheels are adjustable on the axle to suit the width of ridges. The Gearing is entirely enclosed, and of an Improved Method.

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SILVER MEDAL of the Shropshire Agricultural Society, awarded August 3rd, 1888, at Newport.

SILVER MEDAL of the Cheshire Agricultural Society, awarded August 31st, 1888.

SILVER MEDAL of the Royal Manchester, Liverpool, and North Lancashire Agricultural Society, awarded September 5th, 1888.

SILVER MEDAL of the Altrincham Agricultural Society, awarded September 28th, 1888.

SILVER MEDAL of the Staffordshire Agricultural Society, awarded August, 1889.

SILVER MEDAL of the Warwickshire Agricultural Society, awarded September 4th, 1889.

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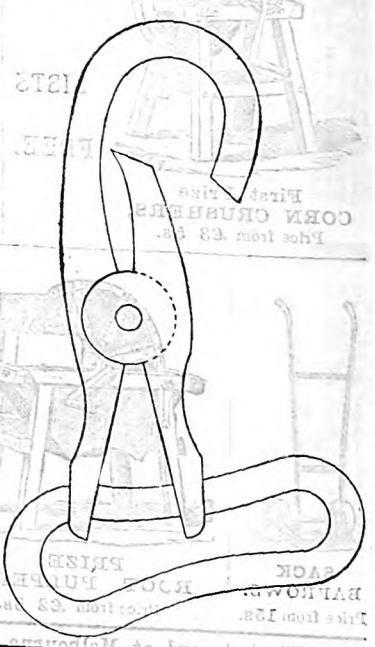
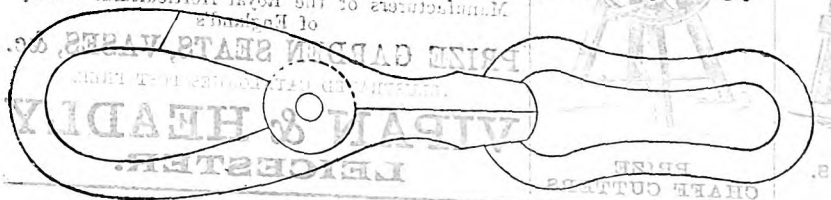


FOR PARTICULARS APPLY TO

McLEAN BROS. & RIGG, LIMITED,

9 & 11 FENCHURCH AVENUE, E.C.



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Carr Mill and Hope Mill, TODMORDEN, England.

LONDON OFFICE—110 CANNON STREET, E.C.

BUFFALO BELTING IS THE BEST DRIVING BELT in the World, and is unrivalled for Economy, Durability, Efficiency, Strength, Grip, and Pliability.

Unaffected by Heat or Damp.

The only Belt made which does not Stretch.

All widths in Stock up to 12-inch.

Thoroughly Seasoned and Ready for Use.

EVERY BELT GUARANTEED.

THE MECHANICAL WORLD.—As exemplifying the protection which the edges of the belt are afforded, we may mention that we recently inspected a belt which had been running for several months bearing heavily against the belt-fork. Although the fork was very much worn, the edge of the belt was apparently uninjured.

SAMPLES AND PRICE LISTS ON APPLICATION.

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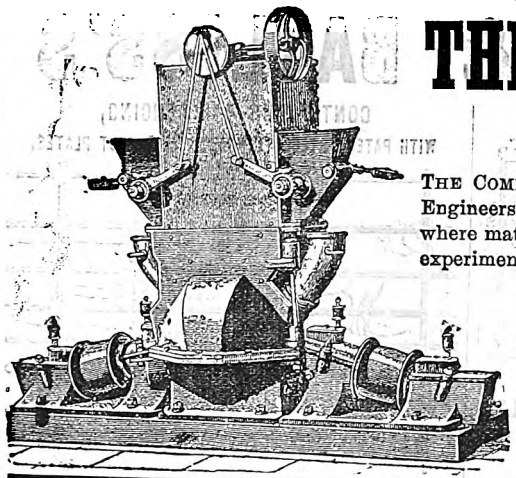

THE CYCLONE PULVERISER,

LIMITED.

THE COMPANY, having now these Machines successfully at work, invite Mining Engineers, Proprietors of Porcelain, Cement, Chemical, and all other Works where materials are required to be in an absolutely fine condition, to inspect their experimental installation at 34 SNOW HILL, HOLBORN VIADUCT, E.C.

These Machines are capable of Pulverising the hardest materials into an impalpable powder, and will operate about 10 tons per day for each M achine, at a less cost than can be done with any other known application of power.

For further particulars please address

Mr. BENJAMIN HOOKER, Engineer,
34 Snow Hill, Holborn Viaduct, E.C.

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JAMES SMYTH & SONS'

PATENT

"NONPAREIL" CORN DRILL.

THE MOST PERFECT AND HANDIEST DRILL OUT

Far ahead of anything yet invented. 3,000 *now in use.*

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PARIS 1867
VIENNA 1873
PARIS 1878
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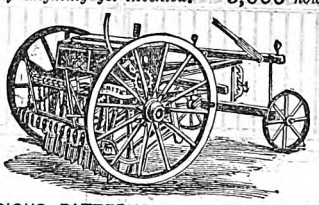
MELBOURNE ... 1881
PARIS 1889



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MADE IN VARIOUS PATTERNS TO SUIT ALL COUNTRIES.

Can be had with American Hoe-Coulters, if desired.

The Patent Hoppers, by tilting on one side, allow the Cup Barrel to be taken out and replaced in two minutes.

Peasenhall, SUFFOLK; & PARIS (65 Rue d'Allemagne).

MANUFACTURERS OF

RAILWAY WHEELS AND AXLES, BRIDGE-WORK,

THE

PATENT SHAFT AND AXLE TREE CO.

LIMITED,

WEDNESBURY, ENGLAND.

AND

all Sections of ROLLED AND HAMMERED IRON AND STEEL.

Low Expenses enable us to Sell at Very Small Profits.
No Agents or Travellers Employed

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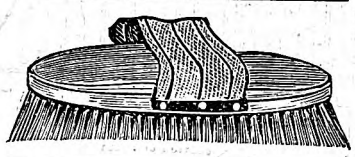

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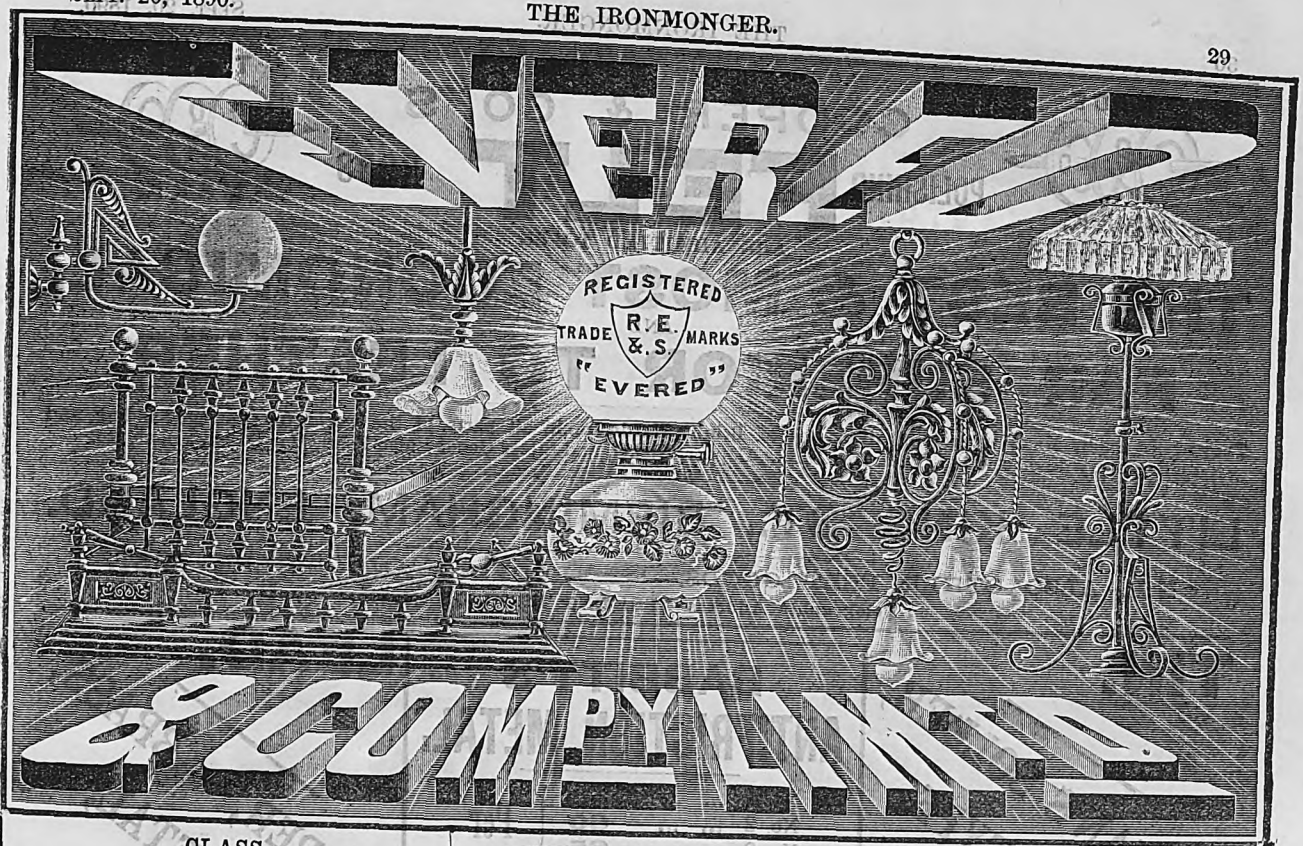

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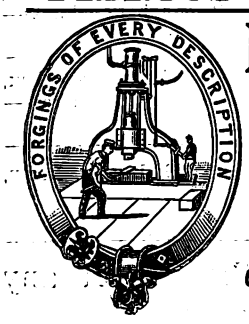

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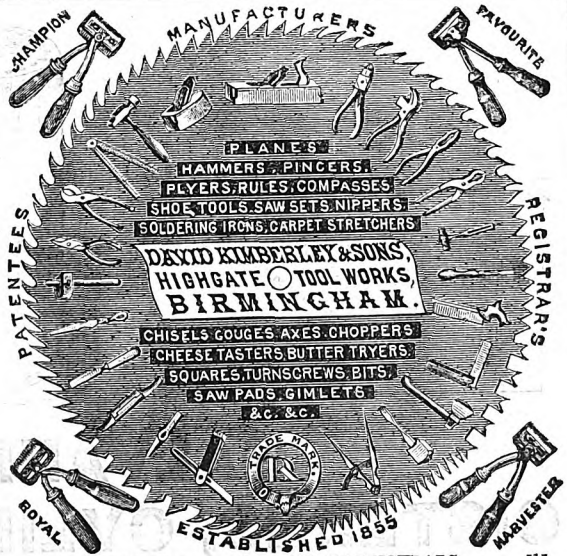

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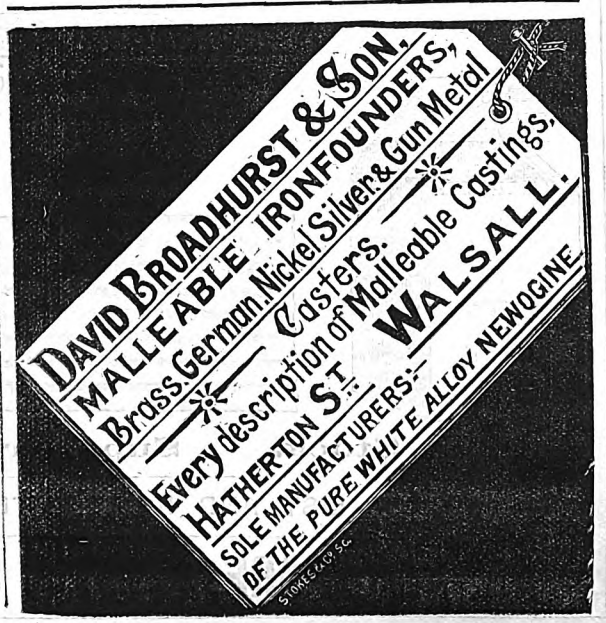

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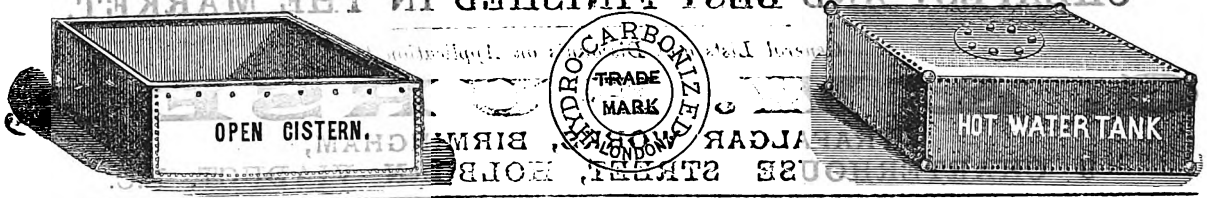

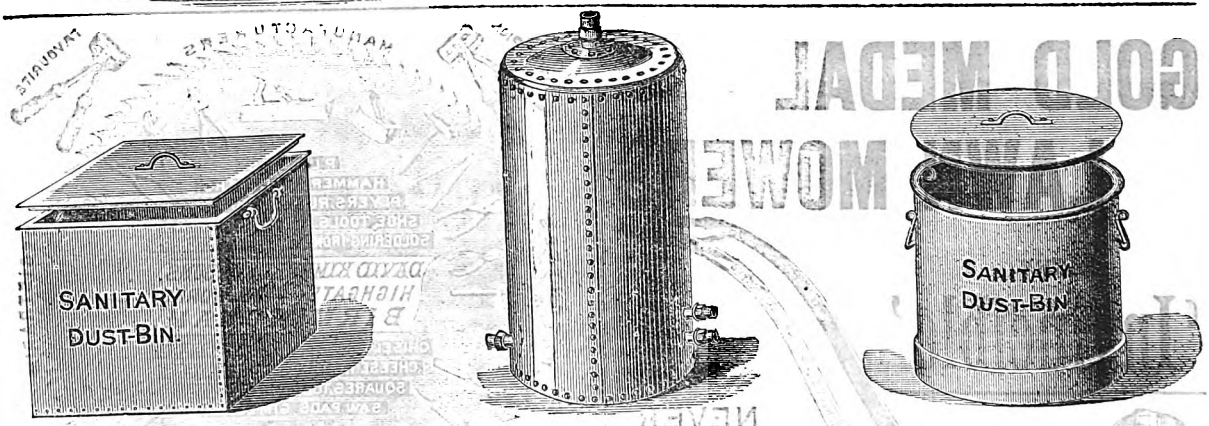

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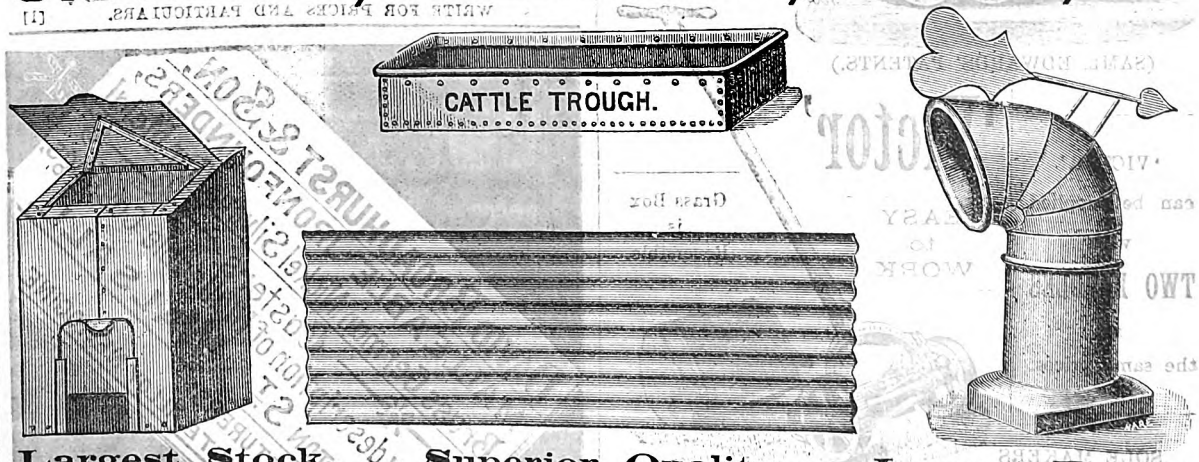

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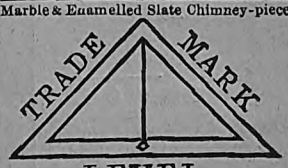

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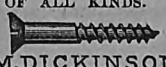

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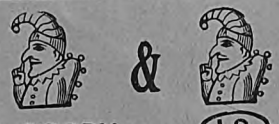

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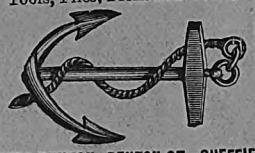

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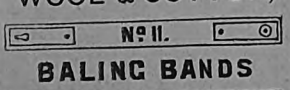

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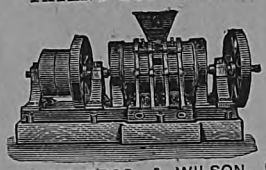
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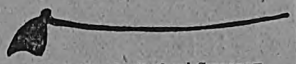

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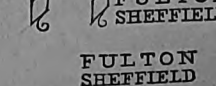

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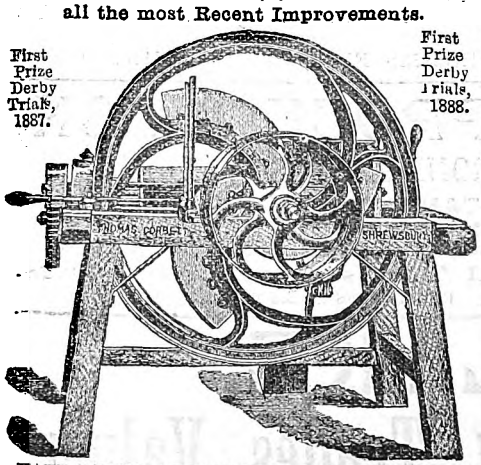

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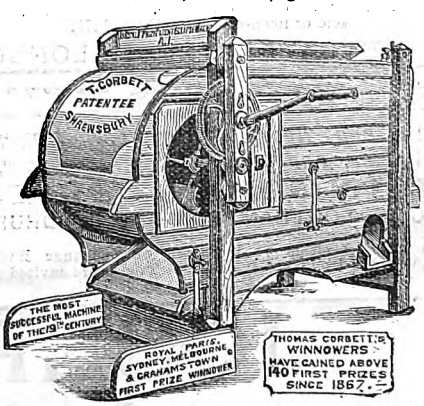

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Businesses Wanted.
Businesses for Disposal.
Premises to Let.
Auction Sales.

SATURDAY, SEPT. 20, 1890.

Partnerships.
Situations Vacant.
Situations Wanted.
Miscellaneous.

The Pages containing the above Announcements can be seen on Saturday morning at 42 Cannon Street, by any Ironmonger or Assistant, or will be posted the same day to any one who sends an addressed postal wrapper. They can be had free on application by callers on Monday morning.

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THE CIRCULATION of this issue of "THE IRONMONGER" amounts to **12,000 COPIES.** *This is the largest and most influential circulation of any medium addressing the Iron, Hardware, Machinery trades, &c., and for that reason Employers and their Assistants should not fail to Advertise their wants in "THE IRONMONGER." Advertisements should be sent by Thursday of each week, although we can receive them by First Post on Friday mornings. 42 Cannon Street, London, E.C.*

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ON TUESDAY NEXT, SEPTEMBER 23rd, AT 11 A.M.

TO BRASS FINISHERS, ENGINEERS, BROKERS, AND OTHERS.

WHEATLEY KIRK, PRICE & GOULTY are instructed by the North-Eastern Railway Company to SELL by PUBLIC AUCTION, on TUESDAY, September 23rd, the whole of the MACHINERY in Forth Street Brassworks, South Street, Newcastle-on-Tyne, lately in the occupation of Messrs. John Mills & Sons (who have been compelled to remove their works owing to railway extensions). The catalogue will comprise twenty-one 6½ in. and 7 in. BRASS FINISHERS' LATHES; five 6½ in. Centre Pillar LATHES; two 6½ in. and 7 in. SCREW-CUTTING LATHES; three CAPSTAN LATHES; DRILLING, EMERY WHEEL, and TOOL GRINDING Machines; two SHAPING Machines; two MILLING Machines; three POLISHING Machines; one 30 in. BAND SAW; HYDRAULIC TEST PUMP; "Gair's" PATENT SHAFT MILLING Machine, &c., &c., by Muir, Mathieson, Butterfield, Thompson, Sterne & Co., Slack's Emery Wheel Company, and others.

Further particulars in Catalogues, to be obtained on application to the Auctioneers, Albert Chambers, Albert Square, Manchester; and 52 Queen Victoria Street, London, E.C. Telegrams:—"Indicator Manchester."

TO LET.

4s. 6d. for 5 lines; 6d. for every additional line; 10 words may be reckoned as a line.

DOUBLE-FRONTED Plate-glass Shop and Premises, with back entrance, one minute from station, S.E.R., and projected L.C.&D.R. station; tram line just completed; growing neighbourhood; two banks recently opened; good opening for Ironmonger, no other near; vacant at Michaelmas: fixtures at valuation, about £14; rent £45, or lease £50. 408 Stanstead Road, Catford, S.E.; or Owner, 247 Lower Road, Rotherhithe.

FOR SALE.

TO CHINA, EARTHENWARE, FANCY DEALERS, &c.

TO BE DISPOSED OF, by Private Treaty, as going concerns, the Stock-in-Trade, Fixtures, and Fittings in the shops now occupied by Mr. Charles A. Harris, China, Earthenware, and General Dealer, being 56 & 57 Queen's Road and 48 High Street, Hastings; also at 5 Crown Parade, Lavender Hill, London, S.W. The whole of the Stocks are in excellent condition and all saleable goods, and the shops occupy the best positions in the respective towns for their kind. The businesses have a good turnover, and present an opportunity which seldom comes into the market; immediate possession can be had.

For further particulars and to view, apply to Mr. G. Graham Poppleton, C.A., General Manager of the Wholesale Traders' Association, 26 Corporation Street, Birmingham.

PARTNERSHIPS.

4s. 6d. for 5 lines; 6d. for every additional line; 10 words may be reckoned as a line.

ENGAGEMENT, with view to immediate Partnership, or otherwise; in a manufacturing business where services and a few hundred pounds will ensure a moderate income; accustomed to workpeople; Agricultural Implement trade, show work, and occasional journeys. 3/21, Office of THE IRONMONGER, 42 Cannon Street, E.C.

MERCHANT and Manufacturer, 30, wishes to meet with a gentleman with knowledge of the trade, with view to Partnership, who is willing to invest £500 to establish a wholesale Hardware house in London; advertiser, having an excellent connection in London suburbs and shipping trade, thoroughly acquainted with the manufacturers and also the small makers to buy from, is confident that good business can be done; commission on the turnover is all that is asked for. 1/29, Office of THE IRONMONGER, 42 Cannon Street, E.C.

PARTNER wanted capable of managing Black and General Ironmongery business; capital required for half share £500 to £700; owner willing to retire gradually; this is a good opening for an industrious man. 33/30, Office of THE IRONMONGER, 42 Cannon Street, E.C.

PARTNERSHIP wanted in good country business; capital about £1,000; General trade preferred in good-sized town; please state returns and profits. 40/30, Office of THE IRONMONGER, 42 Cannon Street, E.C.

PARTNER wanted, with about £1,000, to take share in a very good business in one of the best market towns in the West of England; splendid premises and situation. 3/10 Office of THE IRONMONGER, 42 Canon Street, E.C.

PARTNERSHIP wanted in old-established business; advertiser can introduce about £1,000, and has good knowledge of General Engineering and House Furnishing; London or South of England preferred; principals only. 4/13, Office of THE IRONMONGER, 42 Cannon Street, E.C.

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BUSINESSES FOR DISPOSAL.

4s. 6d. for 5 lines; 6d. for every additional line; 10 words may be reckoned as a line.

MIDLANDS.—Owing to the death of proprietor, a well-established Factor's Business is for disposal; stock and fixtures estimated at £530; returns £5,000 per annum; rent of premises £17 per annum. Apply, Henry Bourn & Werner, 182 Upper Thames Street, London, E.C. No. 754.

CORNWALL.—In a good position in a thriving town, a well-established Furnishing and General Business is for disposal; valuation about £900; returns £1,700; rent of excellent premises, with double-fronted shop, plate-glass windows, and house with 15 rooms, on lease, only £45 per annum. Apply to Henry Bourn & Werner, 182 Upper Thames Street, E.C. No. 755.

YORKSHIRE.—On the outskirts of a large town and surrounded by mills and other works, a Brassfoundry and General Ironmongery Business is for disposal; valuation about £2,500; present returns about £4,000 per annum; rent of excellent premises, including large front shop, warerooms, workshops, brassfoundry, yard, stabling, dwelling accommodation, &c., only £100 per annum. For further particulars apply Henry Bourn & Werner, 182 Upper Thames Street, E.C. No. 761.

SHROPSHIRE.—A very old-established Ironmongery and Agricultural Implement Business for disposal in a good district; returns about £2,000; valuation £1,500, will, if desired, be reduced to £1,200; very extensive premises; extremely low rent; a partnership can, if preferred, be effected with the proprietor. Apply, Henry Bourn & Werner, 182 Upper Thames Street, London, E.C. No. 763.

SOUTH WALES.—In the best position in a good town, owing to the retirement of a partner, a good Furnishing and General Business is for disposal, or a Partner with £1,000 would be entertained with a view to the ultimate purchase of the concern; valuation about £1,700; returns £2,400; excellent premises; moderate rent. Apply to Henry Bourn & Werner, 182 Upper Thames Street, London, E.C. No. 764.

£3,500.—Leading Furnishing and Working Ironmongery in large country town; old-established; good profits. 2715

£1,400.—KENT.—In attractive town; owner deceased; desirable Furnishing and General Ironmongery; returns £2,000; rent £50. 2727.

£1,400.—LINCOLNSHIRE.—Owner retiring; profitable General Ironmongery; spacious premises; small expenses; easy terms of payment. 2667

£750.—UPPER THAMES.—Furnishing and Working Ironmongery in good-class increasing district; roomy premises at low rent. 2703

£400.—SOMERSETSHIRE.—In market town, General Ironmongery; owner retiring; nice premises; low rent; easy terms. 2334

£350.—HERTS.—Furnishing Ironmongery and China; no workmen; returns £750, easily doubled; no opposition. 2724

Many others town and country. No charge for information. S. S. Bromhead, Metal Trades Valuer, 97 Newgate Street, London.

1,200.—ENGINEERING AND IRONFOUNDRY.—For Sale, in small town Suffolk, an old-established concern with good connection; owner deceased; works can be rented or purchased; roomy premises, with residence, office, and every convenience. S. S. Bromhead, Metal Trades Valuer, 97 Newgate Street, London.

MR. LAKE has the following Businesses for Disposal:—

NEAR CLAPHAM JUNCTION.—General and Black, with good bar iron and working trade; requiring about £600.

NORWOOD.—Furnishing, General, and Sundries, with good opportunity of reviving a working trade; most convenient premises, the leasehold of which is for sale with the stock; all at about £2,000.

LONDON, S.E. (Suburb).—Furnishing and General, with exceptionally prosperous working trade; most satisfactory reason for disposing; about £1,000.

WEST END (best part).—Old-established Furnishing Ironmongery; lamps and stoves specially; with the leaseholds of most imposing premises; requiring in all about £5,000.

With many others, £200 to £6,000, particulars of which will be given free to likely purchasers by Joseph Lake, Station Road, Brixton, S.W.

MR. SCAMELL has the following for disposal:—

LONDON, W.—A first-class General Furnishing and Decorative Business, well situated in the centre of a wealthy suburb; large returns; proprietor retiring; valuation about £3,000.

LONDON, W.—A well-established Business in a main, busy thoroughfare; valuation about £700.

MIDDLESEX.—In a first-class market town, an old-established General and Working Business; good returns; valuation about £1,800.

WALES.—An old-established Business, well situated in one of the most favoured summer resorts; returns large; valuation about £3,000.

LONDON, N.—A thoroughly genuine, well-established General Furnishing and Working Business; attractive corner premises; well lighted workshops; valuation about £1,500.

LONDON, S.E.—A capital, easily-managed Business, well situated in a favourite and well-settled locality; good connection and returns, with ample scope for extension; valuation about £650.

For particulars apply to Mr. Scamell, 46 Upper Thames Street, London, E.C.

CORNWALL.—Furnishing and General Ironmongery Business in Seaport Town; Good Dwelling-house and premises; moderate rent; varied stock, about £3,000; arrangements made for portion to remain, and assistance could be given to suitable person. 3/4, Office of THE IRONMONGER, 42 Cannon Street, E.C.

LONDON, W.—Ironmongery and Working Business, close to a principal West-end station; good premises, rent £85, but part sublet; stock, fixtures, and working tools, £400, or at a valuation. Apply, William H. Howarth, Valuer and Agent, 35 Schubert Road, Putney, London, S.W.

LONDON, E.—The Business of an Engineers' Outfitter, Machinist, and Ship Smith; 57 years established; stock, fixtures, &c, about £3,500, or at a valuation; rent of shop, house, and workshops, £40. Apply, William H. Howarth, Valuer and Agent, 35 Schubert Road, Putney, London, S.W.

LONDON, S.E.—Working Business, Ironmongery, &c.; 13 years established; ample and regular employment for workmen kept; also a Branch Ironmongery Business (modern); both owned by same proprietor; a practical Plumber and Gas and Hot-water Engineer could do well; amount of take small. Apply to William H. Howarth, Valuer and Agent, 35 Schubert Road, Putney, London, S.W.

WEST CORNWALL.—Ironmongery Business for sale owing to death of proprietor; established 15 years; excellent roomy premises; rent £90, or freehold would be sold if desired; pleasantly situated in a favourite resort; stock at valuation, not large, having been considerably reduced. Apply, William H. Howarth, Valuer and Agent, 35 Schubert Road, Putney, London, S.W.

FOR DISPOSAL, several Ironmongery Businesses from £250 to £5,000 in London and the Provinces; also 3 Working Cutlery and Tool Businesses from £150 to £800. Please notify businesses wanted and for disposal to William H. Howarth, Valuer and Agent, 35 Schubert Road, Putney, London, S.W.

WHOLESALE and Manufacturing Business to be disposed of; old established; large number of orders in hand; steadily-increasing returns; probable amount of valuation for stock, fixtures, plant, and patents, about £1,500. Apply 3/17 Office of THE IRONMONGER, 42 Cannon Street, E.C.

NORTH WALES.—General and Furnishing Ironmongery Business for disposal in best position in a popular seaside resort; valuation about £400, which could be reduced if desired; a good opening for a Welsh-speaking gentleman; satisfactory reason given for disposing. 275/31, Office of THE IRONMONGER, 42 Cannon Street, E.C.

IRON and Brass Founder's Business for disposal; capital required about £1,600. Apply, Taylor & Heaton, Chartered Accountants, 46 Cherry Street, Birmingham.

BUSINESSES WANTED.

4s. 6d. for 5 lines; 6d. for every additional line; 10 words may be reckoned as a line.

BUSINESSES WANTED.—Mr. Bromhead begs to remind Ironmongers that Autumn is the best time for disposing of Ironmongery Businesses, as buyers are numerous and desirous to be settled before the Winter demand sets in. Mr. Bromhead has sold three this week, and has twenty-two genuine applicants ready to buy or join established concerns. 97 Newgate Street, E.C.

WANTED to purchase a London Wholesale Business; £10,000 to £15,000; not particular what, so long as it shows a fair return for capital and energy: premium paid for anything specially good. Address, in confidence, "Emptor," care of S. S. Bromhead, 97 Newgate Street, London.

EMPLOYERS WANTING ASSISTANTS.

4s. 6d. for 5 lines; 6d. for every additional line; 10 words may be reckoned as a line.

DRAUGHTSMAN and Clerk wanted for London office, with knowledge of Ironmongery; must write a good business letter. Address, stating age, wages, and previous employers. 130/33, Office of THE IRONMONGER, 42 Cannon Street, E.C.

PLUMBER wanted immediately; must be a thoroughly experienced man; used to the jobbing work of an Ironmonger's shop, and able to do tinwork. Apply, stating age, wages required, and experience, to Paton & Co., Ironmongers, Swansea.

TINMAN wanted, who can fix Bells, Iron Roofs, Spouts, Fences, and Gas Fittings, and do a little Whitesmithing. A good character indispensable. State age, references, and wages to Linney & Horobin, Ironmongers, Bedworth.

WANTED, a Bookkeeper, a fair salesman, having to assist at counter, and not afraid of work. State age, experience, and salary expected (outdoors), Alcock, Ironmonger and House Furnisher, Cheadle, Staffordshire.

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WANTED, a steady and experienced Workman; Plumbing, Electric and Wire Bell Hanging, Gas Range, and Water Fitting; Light Smith's work, Locks, Tin and Zinc repairs, and general work of an Ironmonger's shop. State age, wages, and references to W. Mitchell, 90 High Street, Wandsworth.

WANTED, Practical Gas, Hot Water, Stove and Range Fitter, Crank and Electric Bell Hanger, and general work of an Ironmonger's shop. Permanency for a good and steady man. State age, reference, and wages. T. W. Anns, Ironmonger, Faringdon, Berkshire.

WANTED, as leading hand, a thoroughly competent Assistant: with good general experience; must be energetic and of good address: one used to workmen preferred. Apply, in first instance by letter, with references, and Photo if convenient, stating age, particulars of experience, salary required, and when at liberty. H. B. Beeny, Ironmonger, 59 High Street, Putney, S.W.

WANTED, Junior Assistant; state age, experience, salary (out of doors), and when at liberty. T. M. Kingdon, Ironmonger, Basingstoke.

WANTED, Junior Assistant for General and Furnishing (South Coast); must be good stock-keeper; steady and obliging; and with knowledge of bookkeeping preferred; state salary (outdoors) and particulars of experience to 3/3, Office of THE IRONMONGER, 42 Cannon Street, E.C.

ASSISTANTS WANTING SITUATIONS.

1s. for twelve words; 6d. for every 10 words beyond.

ASSISTANT and Traveller; age 35; Pembry, 143 Upper Kennington Lane, S.E.

ASSISTANT; 5 years' experience Builders' and Black; good references. Aldridge, Ironmonger, Croydon.

ASSISTANT, aged 31, requires situation of trust or with view to partnership; highest references; 15 years' experience. C., 33 Gillygate, York.

ASSISTANT; wholesale or retail in London; not afraid of work. P., 2 Albert Street, Kennington Park, S.E.

ASSISTANT; 10 years' first-class experience General, Furnishing, and Builders'; aged 25; good references; salary moderate. "Iron," Newbottle, Banbury, Oxon.

ASSISTANT; General, Furnishing, and Builders'; 5 years' experience; good references; at liberty; aged 21; height 6 feet; town or country. Colman, 30 Broadway, Wimbledon.

ASSISTANT; 4 years' experience in high-class General and Furnishing; aged 20; good salesman; excellent references. H. Brough, Bridge House, Cirencester.

ASSISTANT, late of Temple & Co., Stratford, E., seeks re-engagement; 10½ years' town and country experience; Builders', General, and Furnishing; total abstainer; trustworthy and obliging. Present address, B. Clarke, Great Broughton, Carlisle.

ASSISTANT wants situation as Junior, indoors preferred, in Furnishing and General Ironmongery Business; 6 years at trade; tall; aged 22; can give best references. "Iron," 1 Walker Road, Harrogate.

ASSISTANT; 8½ years' experience in best class Furnishing, General, and Builders'; 24 years of age, tall, strong, and active, with good references. 279/13, Office of THE IRONMONGER, 42 Cannon Street, E.C.

ASSISTANT; 15 years' experience; Black and Builders'; disengaged. 2/2, Office of THE IRONMONGER, 42 Cannon Street, E.C.

ASSISTANT; aged 28; General; first-class experience. Z., 57 Wellington Street, Luton.

ASSISTANT; General, Furnishing; 6 years' experience; good reference. L., care of Messrs. Randell, Ironmongers, North Walsham.

ASSISTANT or Clerk; 8½ years' experience; General and Furnishing; accustomed to books, sole management of workmen, &c.; desires permanency. Thomas, 59 Park Avenue, Oswestry.

ASSISTANT; 8 years' good experience in Furnishing and Builders' Ironmongery; first-class references; accustomed to workmen. S., 164 Malden Road, Kentish Town, N.W.

ASSISTANT; 26; 10½ years' practical experience, General, Builders', and Furnishing; highest references; at liberty. "Steel," 13 Princess Road, Edgbaston, Birmingham.

ASSISTANT or Traveller; 6¾ years' good experience, General, Furnishing, Builders', and Agricultural; aged 23 years; highest reference; at liberty. Burrow, Merton, North Devon.

ASSISTANT, with thoroughly sound London and country experience, Factors', Brassfoundry, General, Furnishing, Builders' and Tools. Energetic and pushing salesman. Abstainer. Permanency desired. 3/25, Office of THE IRONMONGER, 42 Cannon Street, E.C.

ASSISTANT. 7 years' experience Furnishing, General; tall. Francis, Scarlett's, West Bergholt, Colchester.

ASSISTANT, General, Furnishing; 7 years; good references. Crofts, Lumley Road, Skegness, Lincolnshire.

ASSISTANT; 10 years' experience General, Furnishing, and Builders'; Mill Furnishing; well up in Electric Bells, &c.; excellent references. 1 West Street, Blackpool.

ASSISTANT; 23 years' London experience General, Furnishing, and Builders'; good reference. J. Ling, 84 Mayton Street, Holloway, N.

ASSISTANT or Junior; aged 21; General and Furnishing; 7½ years' experience; good references. Apply, D., 31 London Road, Bromley, Kent.

ASSISTANT (General, Furnishing, and Builders') wants situation in October; 8 years' experience and 25 years of age. 3/6, Office of THE IRONMONGER, 42 Cannon Street, E.C.

ASSISTANT; General, Furnishing, Builders', Cutlery, Electroplate; 8 years' experience; good stockkeeper, salesman and window-dresser, and bookkeeper; first-class references; permanency required; aged 24. F. G. Tebbutt, 3 Primrose Hill, Northampton.

ASSISTANT; 4 years experience; Furnishing and General; highest references; height 5 ft. 10 in. L., care of Mr. McBean, Ironmonger, Ludlow.

ASSISTANT; General, Furnishing, and Builders'; 4½ years' experience in high-class trade; energetic; aged 22; height 5 ft. 6 in.; could help at books; satisfactory references; used to workmen; photo. E. Wright, 6 Paul Street, Taunton.

ASSISTANT, General, Furnishing, Builders' and Black Ironmongery; 9 years' experience; good reference. T. W., care of Mr. Calver, Market Square, Downham Market.

ASSISTANT; 7 years' experience in General, Furnishing, and Builders' Ironmongery; good references. "Iron," Springfields Villa, St. Anne's Road, Hitchin.

AS ASSISTANT, Traveller, or Branch Manager; at home or colonies; over 13 years' experience; has successfully managed a business on the South Coast for 3 years; used to workmen and books; aged 28; abstainer; married. 279/12, Office of THE IRONMONGER, 42 Cannon St., E.C.

BOOKKEEPER or Assistant; experienced. J., 20 Belgrave Street Penzance.

CORRESPONDENT or Bookkeeper; expert shorthand writer, with a knowledge of Ironmongery; several years in situation; age 25; salary about 35s. London preferred. 2/31, Office of THE IRONMONGER, 42 Cannon Street, E.C.

CLERK (50), Bookkeeper, Prime Cost, or Timekeeper and Delivery; used to workmen. H. A., 200 Gt. Portland Street, W.

CLERK, Bookkeeper, Shorthand; Builder's or Ironmonger's; 5½ years' experience; aged 22 years. J. B., 31 Grovedale Road, Upper Holloway.

CLERK.—Re-engagement required; thoroughly acquainted with correspondence and general office routine; highest references. Apply, B., 178 Albion Road, Stoke Newington, N.

CLERK (52); bookkeeping, collecting; whole or part week. "Iron," 5 Ashington Road, Fulham, S.W.

EXPERIENCED Man; Builders', Black, and General; Wholesale and Retail; London experience; leading hand; stocktaking, manage branch, or travel. G., 171 Bow Road, E.

GENERAL CLERK or Traveller; 16 years' first-class experience Iron, Steel, Hardware; thorough knowledge shippers, manufacturing engineers. R., 43 Blythe Vale, Catford.

INVENTORS and Engineers.—Employment desired as Clerk or Assistant; experienced with inventions and English and Colonial patents. J. H., 3 Cambridge Road, New Malden, S.W.

IRONMONGER'S ASSISTANT, Salesman, or Traveller, honest, obliging, industrious, seeks engagement; aged 25; has had practical experience in every hardware department for over 9 years. Address, "Abstainer," 14 Prospect Place, Newcastle-on-Tyne.

IRONMONGER'S son; aged 20, with 4 years' experience; salary not so much an object as a good business house; references given; not afraid of work. H. Pomeroy, 4 Wellington Street, Teignmouth.

STOCKTAKING; experienced; equal to professional; good reference. "Iron," 39 Selsdon Road, Croydon.

STOCKTAKING; engagements solicited. Lloyd, Syston, Leicester.

STOCKTAKING; experienced hand; stocks written in detail, priced out, and sheets left for future reference. Shrimpton, 51 Little Britain, London, E.C.

STOCKTAKING.—Engagement solicited; stock straightened and arranged, or good permanency; highest references. H. Green, care of Mr. Baker, Church Street, Ashbourne, Derby.

YOUNG MAN, 22, with 6 years' thorough experience in General, Furnishing, and Builders', wants good position as Salesmen or would not object to travelling. L., 31 Bush Lane, E.C.

YOUNG MAN, 23 years of age, with vast experience in English and American Copper Manufacturing, wants a situation as Foreman or situation where ability would count; steady and sober; first-class testimonials. 275/30, Office of THE IRONMONGER, 42 Cannon Street, E.C.

ADVERTISER, aged 31, late buyer for large limited company, desires situation as Manager, Assistant, or Traveller; thorough business habits and well up; good references. Harvey, Bank House, Hinstock, Market Drayton.

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A TRAVELLER, with connection amongst Ironmongers, London and suburbs, wishes to meet with a good opening; at present representing Hardware Factor in London and suburbs. Age 28. For further particulars address 2/9, Office of THE IRONMONGER, 42 Cannon Street, E.C.

ADVERTISER, aged 26, four years with present firm, 11 years' sound experience, wishes engagement to represent good house. Accustomed to do short journeys in West of England. 2/30, Office of THE IRONMONGER, 42 Cannon Street, E.C.

A GENTLEMAN, having had 14 years' experience as Buyer, Salesman, and Manager of the Cutlery and Electroplate departments in a large retail Furnishing Ironmongery establishment, is desirous of obtaining a situation with a wholesale firm in either of the above branches. Address, 1½/109, Office of THE IRONMONGER, 42 Cannon Street, E.C.

AS TRAVELLER; home or abroad; aged 29; 15 years' good experience. 2/33, Office of THE IRONMONGER, 42 Cannon Street, E.C.

MANAGER or responsible position wanted by methodical business man; 14 years' varied experience; accustomed to books, workmen, and buying; 3 years similar position; good references; at liberty. 1/30, Office of THE IRONMONGER, 42 Cannon Street, E.C.

MANAGER or Assistant. Furnishing, Cutlery, Builders', Agricultural; 20 years' all-round experience. 2/40, Office of THE IRONMONGER, 42 Cannon Street, E.C.

MANAGER or Leading Assistant; 25 years' experience; understands the Trade in all its branches; good reference. James Hellier, 111 Park Street, Hereford.

MANAGER or responsible position wanted by enterprising practical business man; aged 30; 16 years' good experience; accustomed to buying, books, or workmen, and proper discipline of Ironmonger's shop. 2/11, Office of THE IRONMONGER, 42 Cannon Street, E.C.

RESPONSIBLE situation required by Advertiser with Manufacturing firm, or in London Show-room of same; thoroughly experienced Assistant and Salesman; willing to travel if required; 14 years' experience in the Furnishing, Cutlery, and Electroplate; aged 31. 4/14 Office of THE IRONMONGER, 42 Cannon Street, E.C.

TRAVELLER, with good country connection among Smiths, Wheelwrights, Painters, &c., wants engagement. 274/8, Office of THE IRONMONGER, 42 Cannon Street, E.C.

TRAVELLER requires re-engagement in Ironmongery trade; 12 years General experience; good references; small connection in London and country. Write, "Iron," 21 Ferndale Road, Clapham.

TRAVELLER or Manager; 16 years' experience. Ernest, 25 Station Road, Church End, Finchley.

WANTED immediately a situation as Traveller, Manager, or any place of trust, by an experienced man; aged 37; good references; would go abroad. "Iron," 2 Brunton Villas, Rylands, Hereford.

JUNIOR ASSISTANT; General, Furnishing, and Builders'; 4 years' experience; aged 20; good reference. 1/19, Office of THE IRONMONGER, 42 Cannon Street, E.C.

JUNIOR ASSISTANT or Improver; aged 20; 4½ years' experience. D. J. C., 172 High Street, Ryde.

JUNIOR; 3 years' experience General, Furnishing, Tools, Agricultural; aged 19½. 2/36, Office of THE IRONMONGER, 42 Cannon Street, E.C.

JUNIOR ASSISTANT; 6 years' experience (London and country); good references. R. Marshman, South Street, Wareham, Dorset.

JUNIOR ASSISTANT; 4 years' experience; Wholesale Builders', General, and Tools; undeniable references; energetic, and of good address; South Coast preferred; disengaged September 21st. E. Thorpe, Millbrook, King's Hall Road, Beckenham, Kent.

JUNIOR ASSISTANT seeks situation in Furnishing, General, and Builders'; 5 years' experience; age 21; good references. Waller, Whitton, Ipswich.

JUNIOR ASSISTANT; 4 years' experience; Furnishing, Builders' and Tool Trade; height 5 ft. 11 in.; excellent references from present employer; Midland or Northern counties preferred. Gibson, care of Franklin, Ironmonger, Coventry.

JUNIOR ASSISTANT; General, Furnishing, and Builders'; 4 years experience; good reference. W. Wilshere, Uplands, Stroud, Glos.

JUNIOR ASSISTANT (4½ years' experience Builders', General, Furnishing; moderate salary) desires engagement in good house. "Iron," 44 Fountain Street, Anlaby Road, Hull.

JUNIOR ASSISTANT; aged 22; 5½ years' experience General, Furnishing, and Builders'; outdoors; good permanency required. Brooker, 40 Highfield Street, Leicester.

AS TINMAN, by young man used to the General work of first-class Ironmonger's shop. A. Fuller, 7 Queen Street, New Town, Cambridge.

GAS, Hot and Cold Water Fitter, Locks, Bells, Stove, Range, and General hand. "Fitter," 9 Carlisle Terrace, Hythe Road, Staines.

GAS, Hot-water, Bells (Electric and Crank), Locks, Brasswork, and good General hand, by young man; town or country; good references. F. Smith, 15 Estcourt Road, North End, Fulham, London.

GAS, Hot Water, Locks, Bells, and good General Ironmonger's Hand; town or country. H. S., Fitter, 21 Blackmore Street, Strand, W.C.

GAS, Bells, Forge, Ranges, Hot and Cold Water, &c. Young man (23) wants employment, town or country. Gillbert, 62 Duke Road, Chiswick.

PLUMBING, Gas, Bells, Tinwork, &c.; accustomed to the work of good ironmongers' shop. F. W., 8 Brunswick Road, Highgate Hill.

TINMAN, General; accustomed to work of Ironmonger's shop; 12½ years' experience in all branches. J. Bradley, 101 St. John's Road, Faversham.

TINMAN, 22, requires situation; used to General Ironmongery. 8 Victoria Street, Gloucester.

TO WHITESMITHS.—Situation wanted by a good General hand; 10 years' experience; good references. G. Biden, 135 Newcome Road, Fratton, Portsmouth.

APPRENTICESHIPS.

4s. 6d. for 5 lines; 6d. for every additional line; 10 words may be reckoned as a line.

EDMUND SALE, 8 Bridge Street, Taunton, has a vacancy for a well-educated and smart youth as Apprentice to a first-class business (indoors); residence at private house out of the town; healthy position.

AN Ironmonger wishes to place his Son, aged 19, three years' experience in the business, with a respectable firm as an Improver. 129/9, Office of THE IRONMONGER, 42 Cannon Street, E.C.

MISCELLANEOUS.

4s. 6d. for 5 lines; 6d. for every additional line; 10 words may be reckoned as a line.

JAMES LEWIS & SONS, Merchants and Manufacturers, Sheffield, are prepared to accept a few Sole Agencies for specialities; representatives calling regularly upon Engineers, Contractors, Collieries, Ironfounders, Steel and Iron Works, &c.

TO BUILDERS, Architects, Gasfitters, &c.—Solid Brass Chandeliers, manufactured by Winfield & Co., one about 12 ft. with 6 three-light branches; 2 about 9 ft. with 5 three light branches; all have deep solid brass ornamental rims, are second-hand, but in good condition. What offers? G. Chester, Hardware Merchant, St. Jude's Passage, Birmingham.

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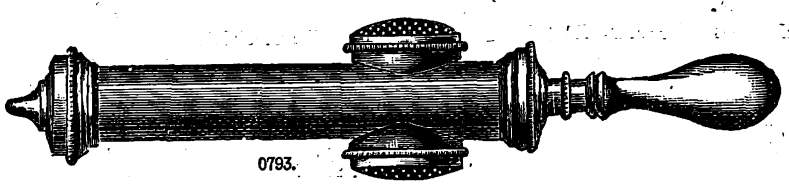

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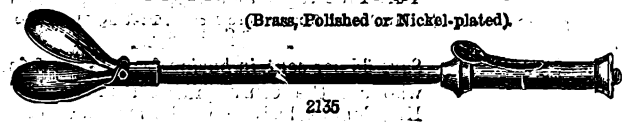

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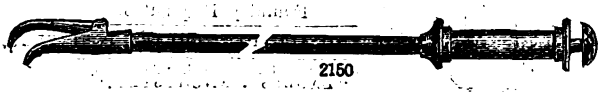

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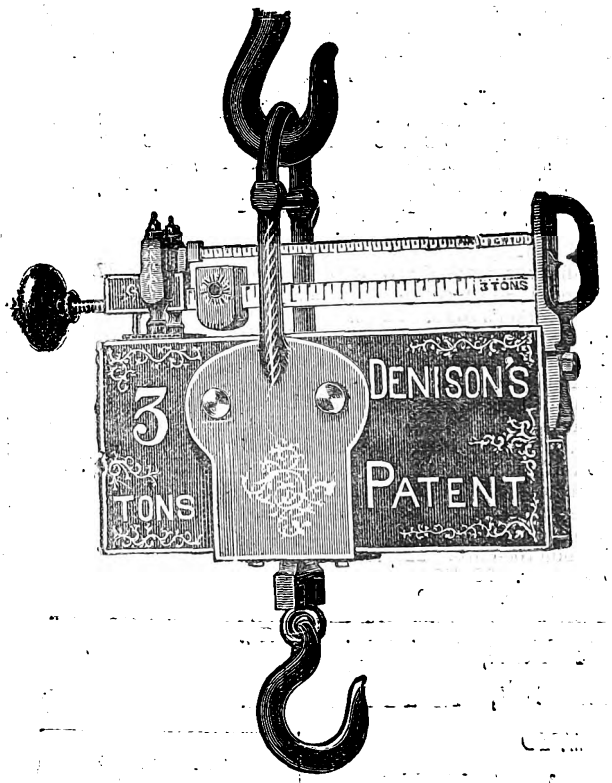

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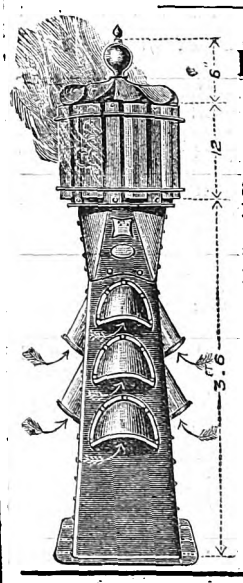

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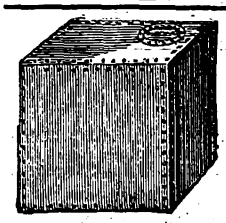

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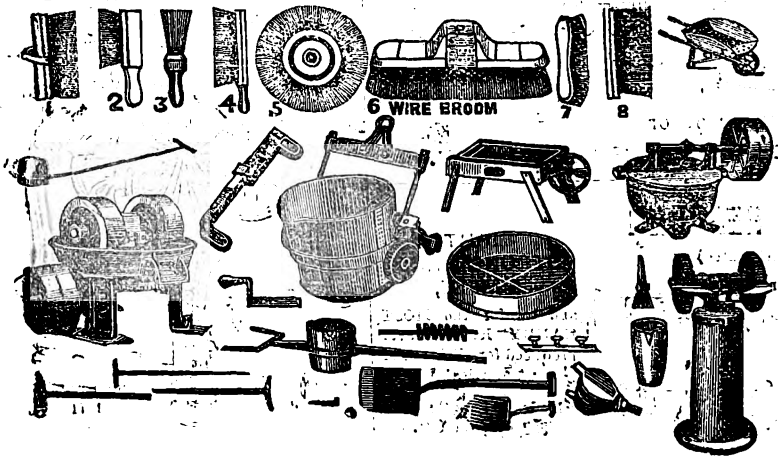

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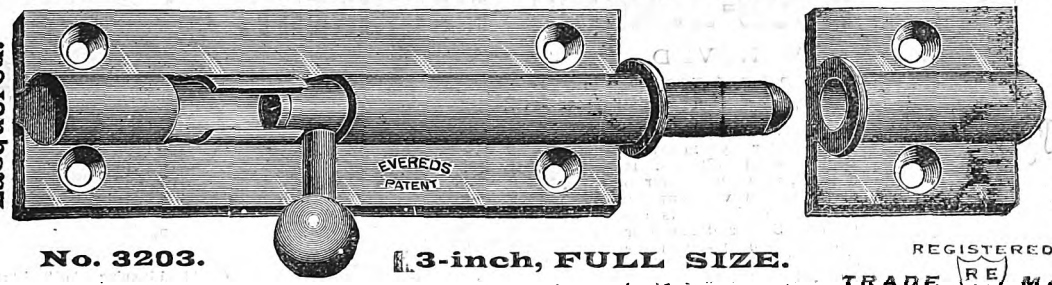

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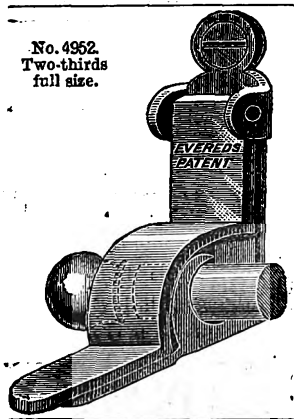

This fastener comprises a secure **stair rod eye and end combined,** which allows the rod to be removed by lifting the polished front. **The fastener itself forms the end of the rod.** No fitting is necessary; all that is required is to cut the rods to the length desired. The principal parts being made of one piece of metal there is no possibility of derangement, and no strain of the carpet, however great, can remove the rod, **and the fastener is so designed that even if the front or cover is pulled off, the rod remains securely held,** an advantage which can be claimed by no other similar contrivance. It is also made to suit the ordinary or common solid stair rod.

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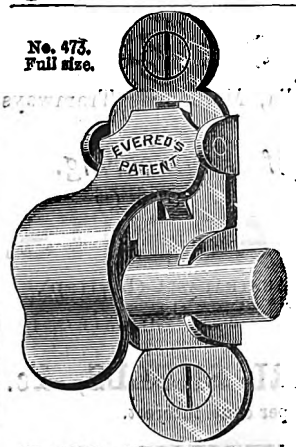

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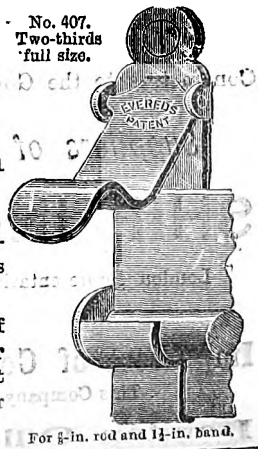

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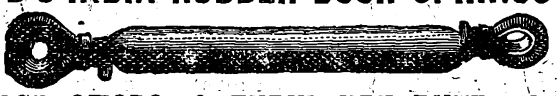

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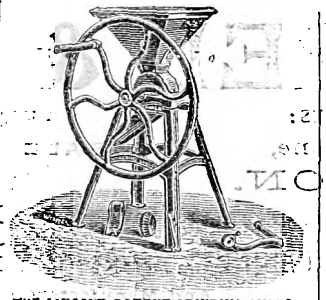

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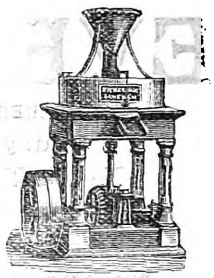

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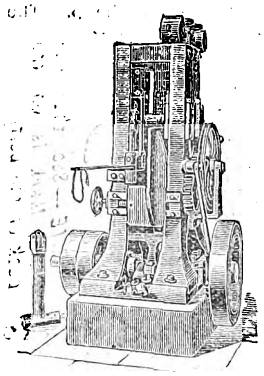

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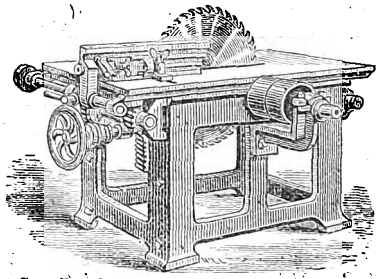

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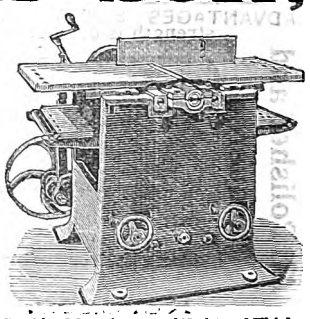

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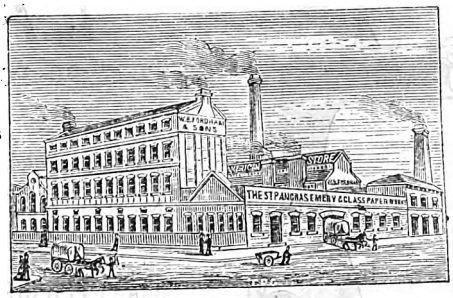

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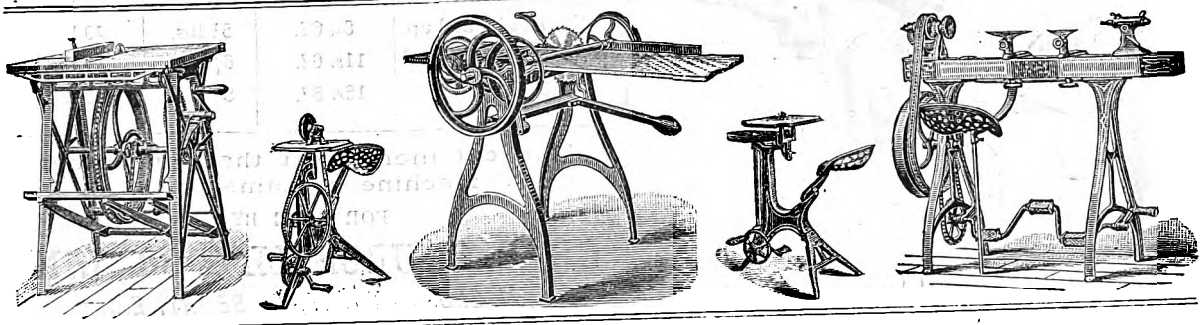

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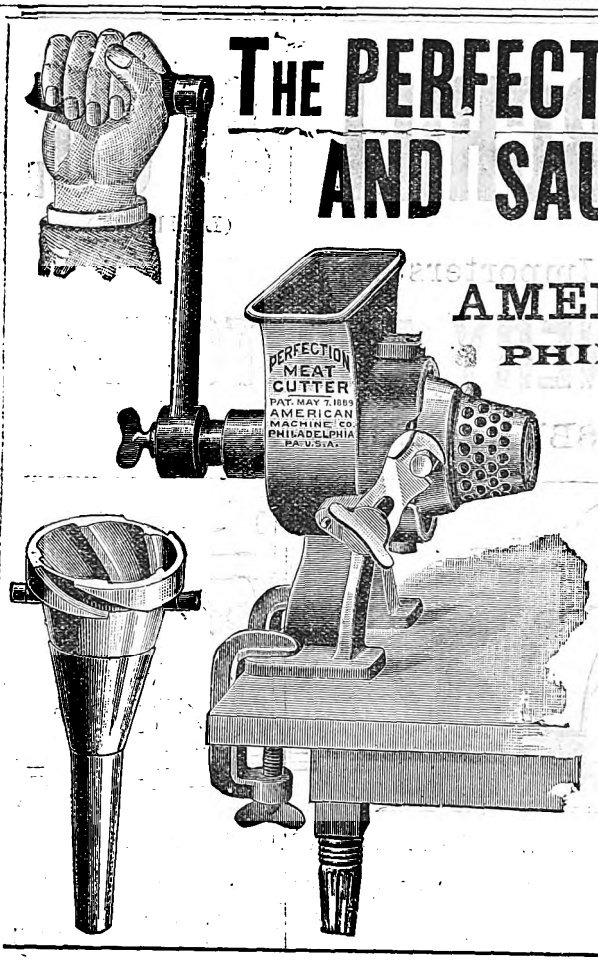

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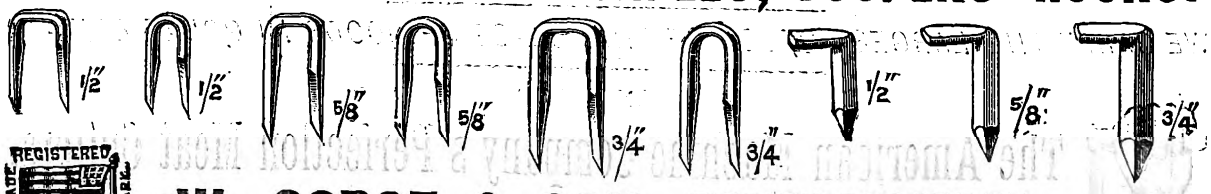

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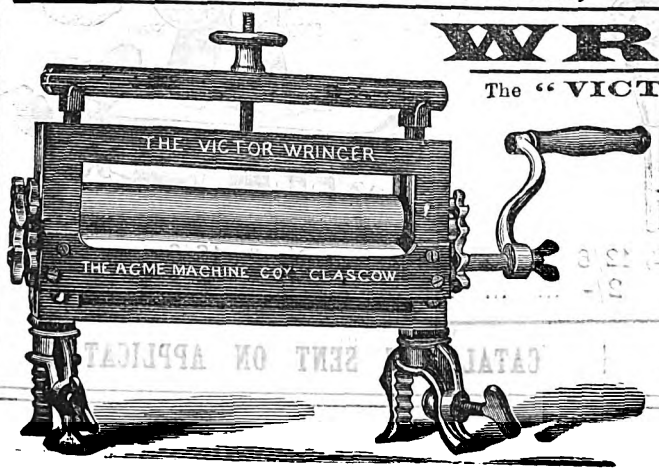

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Incandescent Gas Light Co., Lim.
Falk, Stadelmann, and Co., Lim.
Hulett, D., and Co., Lim.
Peebles, D. B., and Co.
Shaw, J.
Speller, C.
The Mint (Birmingham). Lim.
Winfields, Limited
Winn, C., and Co.

GAS HEATING APPARATUS
Freeman, Emery and Co.
Hulett, D., and Co., Lim.

GATES, IRON
Bayliss, Jones and Bayliss

GAUGE GLASSES
Kerr and Jubb
Tomey and Sons

GELATINE
The Grove Chemical Co.

GLASS
Arculus, A.
Lecomte-Falleur, J.

GLAZING
Braby, F., and Co.
Drummond Patent Glass and Glazing Co.
Grover and Co., Lim.
Pennycook Patent Glazing and Glazing and Engineering Co. Lim.

GLUE
The Grove Chemical Co.

GOLD-MINING PLANT
Fletcher Bros.

GOVERNORS (GAS)
Shaw, Joseph

GRATES, RANGES, AND STOVES
Acme Co., The
Arden Hill and Co.
Baths Foundry Co.
Bennett's Iron Foundry Co.
Camelon Iron Co.
Carron Co.
Clay, A., and Co.
Derwent Foundry Co.
Forth and Clyde Iron Co.
Freeman, Emery and Co.
Green, Wm., and Co.
Hydes and Wigfull
Jepson, A.
Jones and Campbell
Mathieson, Wilson and Co
Micklethwait and Co.
Perrot and Habersham
Petter, J. B.
Portway, C., and Sons
Russell, R., and Sons
Scandinavian Stove Co., Lim.
Schooling and Co., Lim.
Smith and Wellstood
Springfield Foundry Co.
Steel and Garland
Steven Bros. and Co.
Taylor, Wm.
Watson, Thos., and Sons
Wenham Co., Lim.
Wright, Geo., and Co.
Wright and Butler, Lim.
Yates, Haywood and Co.

GRINDING MILLS, CORN, COFFEE, &c.
Bamford and Sons
Corns, W., and Sons
Parkes, Z., and Co.
Purshouse, B. M.
Woodgates James

GRINDSTONES
Bean, H.
Hickman, R.
Salmen, A. B.

GUN-METAL STEAM FITTINGS
Barwell, James
Dixon, S., and Son
Gummer, W. H., and Co.
Hepton and Son
Knowles, J., and Sons
Rhodes, B.
Storey and Sons
Tyler, Hayward, and Co.

GUNPOWDER MFRS
Curtis and Harvey

GUNS AND RIFLES
Midland Gun Co.
Reeves, John, and Co.
The Arms and Ammunition Co.

HAIR BELTING
Lancashire Patent Belting and Hose Co.

HANDLES
Rollins, J. G., and Co., Lim.

HARDWARE
Crowden and Garrod
Fordham and Sons, Lim
Furse and Simmonds
Goodall, H. A., and Co.
Hurley, Edward S.
Kidston, A. G., and Co.
Knox, H. A., and Co.
McLean Bros. and Rigg (Lim.)
Osborn, W. B.

HAT & COAT HOOKS
McEvoy, H., and Co.

HEATING APPRTS
Attwood, J.
Baker, Joseph, and Sons
Chapman, Chapman and Co.
Freeman, Emery, and Co.
Groom, James, and Co.
Hartley and Sugden, Lim.
Jenkins, R., and Co.
Jepson, A.
Jones and Attwood
Keith, James
King, J.
Lincoln and Co.
Lumby, Son and Wood
Mather and Kitchen
Maughan's Patent Geyser Co.
Milan, F.
Newton, Chambers and Co.
Olney, T. C.
Portway, C., and Sons
Scandinavian Stove Co., Lim.
Sweet Bros.
Toope, C., and Son
Wood, J. and W.

HOISTING TCKLE
Priest, R.
Shanks, A., and Son
Tangyes Limited

HOLLOW-WARE
Arkinstall Bros.
Ash, Jos., and Son
Austin, A. J.
Barton, F., and Co.
Braby, F., and Co.
Chromographic Enamel Co.
Griffiths and Browett
Hart, M. J., and Sons
Hill, Francis
Hookham and Sons
Hurley, E.
Kreuser, A. H.
Thale Ironworks, Lim.
Topham and Snushall

HORSE CLIPPERS
Lorme, M., and Co.
Plant, W. and J.
Von Glehn, A., and Co

HORSE CLIPPER SHARPENERS
Oppenheim, S., and Co.

HORSE HOES
Cottis, W., and Sons

HORSE NAILS
Blichfeldt and Co.
Linley, Linacre, and Bingham

HORSE-SHOES
Edwards, W., and Son
Leonhardt and Co.
United Horse Shoe Nail Co. Lim

HORSE-SHOE STUDS
Leonhardt and Co.
Linley, Linacre, and Bingham
Wiley, James

HORTICULTURAL APPLIANCES
Braby, F., and Co.
Chandler, A.
Hill and Smith
Messenger and Co.
Wood, J. and W.

HURDLES
Bayliss, Jones and Bayliss

HOSE AND HOSE FITTINGS
Braby, F., and Co.
Gibb, Jas., and Co.
Macintosh, C., and Co.
Sheath Bros.
Willcox, W. H., and Co.
Winn, C., and Co.

HOUSEHOLD SUNDRIES
Benham and Froud, Lim.
Clark, D., and Sons
Cluley, John
Crowden and Garrod
Fidler, Frank
Fordham, W. B., and Sons, Lim.
Furse and Simmonds
Garrard, H. W., and Son
Goodall, H. A., and Co.
Hawkins and Co.
Knox, H. A., and Co.
Nettlefold and Sons
Pearse, Jas., and Co.
Pipe and Banks
Rollins, J. G., and Co.
Salter, Geo., and Co.
Sinclair, Tweedie and Co.
Starkie, J.
Tinplate Decorating Co.
Walker, J. L., and Holroyd
Warren and Co.
Woodgates James

HYDRAULIC PRESSES & PUMPS
Tangyes Lim.

ILLUMINATING LIGHTS
Hulett, D., and Co.
Parkes, James, and Son
Wilson and Co.

INDIA-RBBR GDS
Moseley, D., and Sons

INJECTORS AND EJECTORS
Fletcher Bros.
Pontifex and Wood, Lim.

IRON BUILDINGS
Braby, F., and Co.
Iron and Steel Fencing and Buildings Co., Lim.
Keay, E. C. and J.
London Iron Building Co.
Lysaght, John, Lim.

IRON (Enamelled)
Glasgow Porcelain Enamel Co.

IRON FENCING
Bayliss, Jones, and Bayliss
Hayward, W., and Co.

IRONFOUNDERS
Attwood, J.
Bean, H.
Bridge, Kent and Bridge
Bridges, Thomas and Sons
Broadhurst, D., and Son
Carron Co.
Clive, Thos., and Son
Dobbie, Forbes and Co.
Fowles, G., and Son
Gameson, T. and Son
Guest, John, and Son
Harper, John, and Co., Lim.
Hawkins and Co.
Heeley, Wood and Co., Lim.
Helliwell, J. H.
Hudswell, Clarke and Co.
Izons and Co.
Maddock, John, and Co.
Mathieson, Wilson and Co.
Newton, Chambers and Co., Lim.
Parkes, H. P., and Co.
Rowbotham, Richard
Shaw, Frank
Sheepbridge Coal and Iron Co., Lim.
Tangyes Lim.
Taylor, C. H.
Taylor, Wm.
Thames Bank Iron Co.

IRON AND STEEL MANUFRS.
Dinsdale Wire and Steel Co., Lim.
Fraser, Geo., and Co.
Henderson and Glass
Herberts Park Iron Co.
Jessop, Wm., and Sons, Lim.
Jevons, Thomas
Kidston, A. G., and Co.
Renton, B. M.
Shelton Iron and Steel Co.
Stringer Bros.
Sutton and Ash
The Staffordshire Steel and Ingot Iron Co., Lim.
Tinn, Josepn

IRON MANUFRS.
Bunch, B., and Sons
Midland Iron Co.
Rollason and Slater
The Staffordshire Steel and Ingot Iron Co., Lim.
Warrington, Henry

JAPANNERS
Blood, T. G.
Griffiths and Browett

JOINERS' TOOLS
Kimberley, D., and Sons

LADDERS
Summerscales, W., and Son

LADDER BRACKTS
Neild, J.

LMPS & LNTERNS
Albo-Carbon Co.
Barwell, James, Sons and Co
Benham and Froud, Lim.
Bocock & Wilkinson
Bray, G., and Co.
Catterson, S. P.
Champion Gas Lamp Co.
Clarke's Pyramid Light Co. Lim.
Crook, G., and Co.
Doughty, J. M.
Eaton, S., and Son
Evered and Co., Lim.
Falk, Stadelmann and Co Lim.
Gardner and Munro
Griffiths and Browett
Halliday, J. C.
Hearn, E. A., and Co.
Hood, J.
Hulett, D., and Co.
Karo, Bennett and Co.
King, J.
Liverpool Lamp Co.
Midland Lighting Co.
Messenger and Sons
Nunn, W., and Co.
Palmer and Co.
Player, J. E. and B.
Ramsay, Wm., jun., and Co
Sharp, W.
Speller, C.
Strode & Co.
Townshend and Co.
Ungar, J., and Co.
Wells, A. C., and Co.
Wells, W.
Williams and Son
Winfields, Lim.
Wright and Butler

LAMP GLOBES AND SHADES
Cochran, A. and R.
Entwistle and Stephens
Falk, Stadelmann, and Co. Lim.
Speller, C.

LATCHS & HINGES
Chatwin, A.
Collins, Jas.
Crompton, Thos.
Evered, R., and Co., Lim.
Russell and Erwin Manufacturing Co.
The James Foundry Co.
Wakelam Bros.

LAUNDRY MCHRY AND STOVES
Acme Machine Co.
Bradford, T., and Co.
Empire Wringer Co.
Kimball and Morton, Lim.
Smith and Paget
Summerscales, W., and Sons
Summerscales' Sons, W. and S
Watson and Whalley

LAWN MOWERS
Cottis, W., and Sons
Rollins, J. G., and Co., Lim.
Summerscales' Sons, W. and S

LEAD, OIL, GLASS
Grey and Marten

LEMON SQUEEZRS
Fordham, W. B., and Sons, Lim
Salter, G., and Co.

LIGHTNING CONDUCTORS
Midland Cordage Co
Tonks Limited

LINEN HOSE
Moseley, D., and Sons

LIQUID FUEL
Rose, G., and Co.

LOCKS
Bates, J.
Bremner, As. & Co.
Cluley, John
Harper, J., and Co., Lim.
Russell and Erwin Manufacturing Co.
Tubular Lock Syndicate Co. Lim.
Turner, Thomas, and Co.
Wakelam Bros.
Walker, Joseph
Yale Lock Co.

LUBRICANTS
Blumann and Stern, Lim.
Wiggin, F., and Sons

LUBRICATORS
Dixon, S., and Son

MACHINE TOOLS
Banks, B.
Butterfield, F. & J., and Co., Lim.
Chatwin, Thomas
Churchill, Chas., and Co.
Heap, Joshua, and Co., Lim.
Leeds Engineering and Hydraulic Co.
Lees, T. and R.
Lomas and Co.
Parkinson, J.
Player, W. and J.
Scott Bros.
Tangyes Lim.
Tasker, Sons and Co.
Vernon and Guest
Wild, J., and Co., Lim.
Wilson Bros.

MANTELPINCES & OVERMANTELS
Bennetts Ironfoundry Co.
Dobbie, Forbes and Co.
Russell, W. A. and C., and Co.
Sessions, J., and Sons

MASONS' TOOLS
Nicholson, B., and Sons

MEAT CUTTERS
Churchill, Chas., and Co.
Markt and Co.
Rollins, J. G., and Co., Lim.
Russell and Erwin Manufacturing Co.
Salter, G., and Co.

MERCHNTS, EXPRT
Kidston, A. G., and Co.
McLean Bros. and Rigg (Lim.)

MERCHNTS, METAL
Barnard, H. E.
Dugard Bros.
Grey and Marten
McLean Bros. and Rigg (Lim.)

MEDALS
Vaughton, P., and Sons

METAL PERFORATORS
Braby, F., and Co.
Harvey, G. A., and Co.

METH. SPIRIT
Jones and Co

MILLING MACH'Y
Turner, E. R. and F.

MINERALS
Behr, H., and Co.

MOULDING MACHINES
Samuelson and Co., Lim.

MOUSE TRAPS
Greenlees, R., and Co.

NAIL PULLERS
Knox, H. A., and Co.

NAILS
Clyde Nail Co., Lim.
Cordes, J. J., and Co.
Danks, Walker and Co.
George and Sons
Giles, John and Son
Linley, Linacre and Bingham
Maddock, John, and Co.
Mountain and Son
Nichols, J., and Sons
Periam, H. W.
Rollason and Slater
Schwarte and Hammer
Shaw, Henry, and Sons

NICKEL-PLATERS
Draper, E. G., and Co.

OILS
Anglo-American Oil Co., Lim.
Bayley, F. J., and Co.
Blumann and Stern, Lim.
Carless, Capel and Leonard
King, J.
Petroleum Association
Price's Patent Candle Co.
Smallman, W. F.

OIL CANS & TINS
Ferguson and Hood
Heslewood, J.
Noakes, B., and Co.

OIL LAMPS
Evered and Co.

OILSTONES
Pike Manufacturing Co.
Salmen, A. B.

OVENS
Baker, Joseph, and Sons

PADLOCKS
Mills and Green

PAINTS & COLORS
Coltnurst and Harding
Docker Bros.
Egleton, F. A.

PAPER
Baldwin, J., and Son

PATENT AGENT
Boughton, H. F., and Co.
Bromhead, S. S.

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PAVEMNT LIGHTS
Hayward Bros. and Eckstein
Wilson and Co.

PETROLEUM
Fox, F. F.

PEWTER GOODS
Mason, S.
Yates, James

PICKS
Hardy Patent Pick Co.
Lyndon, W. A.

PICTURE CORD
Peacock, J.
Tonks, Lim.

PILE SHOES
Copley, J., and Co.

PIPING (STEEL)
Ash, Jos., and Son
Marshall, J., and Sons
Steel Pipe Co., Lim.

PLUMBERS' FITTINGS
Evered and Co.

POLISHING MATERIALS
Cooper and Co.

POLISHING POWDERS
Cooper and Co.
May, Roberts and Co.
Oakey and Sons

POWER HAMMRS
Player, W. and J.

PUMPS AND PUMPING PLANT
Hathorn, Davey and Co.
Leeds Engineering and Hydraulic Co.
Pontifex and Wood, Lim.
Pulsometer Engineering Co.
Richards, R., and Co.
Stannah, J.
Tangyes Lim.
Treggon and Co.
Tyler, Hayward, and Co.
Williams, A., and Co.
Winn, C., and Co.

RAIN-WATER SEPARATOR
Roberts, C. G.

RAILING HEADS
Baxter, L., and Co.

RAILINGS
Springfield Foundry Co.

RAZORS
Johnson, G., and Co.

RICK COVERS
Davies Bros. and Co.

RIDDLES
Brookes, W., and Co.
Rhodes, B.

RIVETS
Cotterill, F. W., Lim.
Fisher and Ludlow
Gadd, T.
Haddon, T., and Co.
Periam, H. W.
Rollason and Slater

ROLLERS
Barford and Perkins
Carron Co.

ROOFING SHEETS
Braby, F., and Co.

RUBBER STAMPS
Pollard, A.

RULES AND TAPES
Preston, Ed., and Sons
Rabone and Sons
Smallwood, I. and D.

SADDLERY
Jardine, J.

SAFES
Griffiths, S., and Sons
Hobbs Hart, and Co., Lim.
Lumby, Son and Wood, Lim.
Perry, T., and Son, Lim.
Tann, J.
Taunton, J. and J.
Turner, Thomas, and Co.
Whitfield, F., and Co.

SAFETY HOOK
McLean Bros. and Rigg, Lim

SALT-ROLLERS
Spratt's Patent, Lim.

SAND BLAST APPARATUS
Tilghman's Patent Sand Blast Co.

SANITARY APPLIANCES
Claughton Bros.
Crapper, Thos., and Co.
Cross, Wm., and Son
Emanuel, A., and Sons
Evered and Co., Lim.
Gregson, J.
Hayward Bros. & Eckstein
Parker, W. F.
Parkinson and Sweaney
Perkins, B., and Son
Phillips, John, and Co.
Smeaton, J., Son and Co
Strode and Co.
Syer, Milton
Waller, G., and Co.
Woodward, Jas., and Rowley

SASH LINES
Austin, J., and Sons

SAWS
Armitage, W. H., and Co.
Atkin and Sons
Beardshaw and Sons
Beckett, A., and Sons
Cooper, Jos., and Son
Fisher, Geo., and Co.
Slack, Sellars and Co.
Spear and Jackson
Tallack, H. T.

SAW HANDLES
Slack, Sellars and Co.

SCISSORS
Pulvermann and Co

SELTZOGENES
May, Roberts and Co.

SCREWNG TCKLE
Chatwin, Thos.

SCREWS
Haddon, T., and Co.
Hawkins and Co.
Nettlefolds, Lim.
Periam, H. W.

SCYTHE STONES.
Linley, Linacre and Bingham
Pike Manufacturing Co.
Salmen, A. B.

SEWING & KNITTING MACHINES
Kimball and Morton
Sellers, W., and Sons

SHAFTING, PULLEYS, &c.
Carbrook Forge and Steel Co.
Jardine, J.
Northern Engineering Co., Lim.
Patent Shaft and Axle Tree Co.
Tittley, Henry, and Son
Unbreakable Pulley Co.

SHOES
Fraser, D., and Sons

SHEEP SHEARS
Burys and Co., Lim.
Ward and Payne

SHEETS, GALVD.
Braby, F., and Co.
Jevons, T.
Phœnix Galvanised and Corrugated Co., Lim.

SHIPPING TCKLE
Bembridge, J., and Co.
Bodill, Parker and Co.
Cradley Shipping Tackle Co.
Patent Ferrule Co.

SHIPS' FITTINGS
Hayward Bros. & Eckstein
Nunn, W., and Co.
Player, J. E., and H.

SIZE
The Grove Chemical Co.

SKATES
Marsden Bros. and Co.

SMOKE PREVENTION APPLINCS
McGreaves, W.

SODA WATER MACHINERY
Barnett and Foster
Bratby and Hinchliffe

SOFT SOAP
Chiswick Soap Co.
Kershaw, J., and Co.
Smallman, W. F.

SPADES & SHVLS.
Hardy Patent Pick Co.
Lyndon, W. A.
The Stockton Heath Forge Co.

SPRING BALNCES
Salter, Geo., and Co.

SPRINGS
Cocker Bros., Lim.

STABLE FITTINGS
Bayliss, Jones and Bayliss
Carron Co.
St. Pancras Ironwork Co.

STAIRCASES
Heyward Bros. and Eckstein

STAIR RODS
Evered and Co.

STAMPERS AND PIERCERS
Baxter, L., and Co.
Fisher and Ludlow
Hawker, F.
Lomas and Co.
Phillips, W., and Sons
Rollo, D., and Sons
Swain & Kirby

STEAM TRAPS
Lancaster and Tonge

STEAM FITTINGS
Fletcher Bros.
Winn, C., and Co.

STEAM INDICATORS
Hannan and Buchanan

STEEL AND FILE MANUFRS.
Atkins, W., and Co.
Howarth and Sons
Howell and Co.
Makin, Marchington and Co.
Taylor, Tom

STEEL MANUFRS.
Andrew, J. H., and Co.
Beardshaw, J., and Sons
Burys and Co., Lim.
Cocker Bros., Lim.
Dinsdale Wire and Steel Co. Lim.
Fairley, James, and Sons
Fisher, Geo., and Co.
Flather, W. T.
Jessop, Wm., and Sons
Oxley, H. J., and Co.
Renton, B. M.
Richardson, T. G., Jun.
Spencer, John, and Sons, Lim
Taylor, T.
The Staffordshire Steel and Ingot Iron Co., Lim.
Tyzack, Sons and Turner
Webster, J. A., and Co.

STEEL SHAFT
Taylor, Tom

STEEL TOYS
Handley and Wilkins
Plant, W. and J.

STOVES
See Grates, Ranges, &c

STREET LAMPS
Evered and Co.

TAPS
The Automatic Tap Syndicate

TEA TRAYS
Shapland and Petter

TILES
Boote, T. and R.
Decorative Art Tile Co., Lim.
Malkin, Edge and Co.
Pearson, E. J., and Co.
Sherwin and Cotton
Simpson, T. A.
Steele and Wood

TILE MAKING MACHINERY
Boulton, Wm.

TINMN'S FURNTR
Fisher and Ludlow
Lomas and Co.

TINMEN'S MACHINES & TOOLS
Blackburn, Hinchliffe and Co.
Fisher and Ludlow
Lomas and Co.
Rhodes, J., and Sons

TIN AND TERNE PLATES
Kidston, A. G., and Co.
Old Castle Iron and Tinplate Co., Lim.
Shimwell and Co.

TINS & OIL BTLS.
Noakes, B., and Co.

TINPLATE WORKERS
Blood, T. G.
Griffiths and Browett
Swain and Kirby

TOOL BASKETS
Salmen, A. B.

TRAPS (MOLE)
Reed, W. H.

TRUNKS
Mohr, C.
Treggon and Co.

TUBE EXPANDERS
Wild, A. M.

TUBE WELLS
Isler, C., and Co.
Williams, A., and Co.

TUBES & FITTINGS
Anchor Tube Co.
Ashton, T. A.
Blorwich Iron and Steel Co.
Brook, T., and Co.
Chisholm and Law
Cope, Allman and Co.
Gill and Russell
Hildick and Hildick
Howell and Co.
John Brotherton, Lim.
Lewis, E., and Sons
Lloyd and Lloyd
Marshall, J., and Sons.
McDougall, James
Pritchard, Thos.
Russell, J., and Co. Lim.
Russell and Sons, Lim.
Rylands, D., Lim.
Spencer, J. and E. S.
Stewart, A. and J., Lim.
Taunton, Delmard, Lane and Co., Lim.
Taylor, T.
Winfields Limited

TURNSTILES
Isler, C., and Co.
Le Grand and Sutcliff

TYPE-WRITERS
Fitch Type-Writer Co., Lim.

UMBRELLA RACKS
Butterworth, M. & W.
Cartland, Jas., and Son
Turner, Thomas, and Co.

VANS
Smith, J. and Sons

VALUERS
Bourn and Werner
Bromhead, S. S.
Coppock and Son
Cowles, W. J.
Howarth, W. H.
Ison, E.
Jones, G. H.
Lake, Joseph
Munk, E. J.
Parsons, C.
Saul, G. F.
Scamell, Geo.
Shepherd, E. L.
Taylor, C.
Ulph, J. B.
Verity and Riley

VALVES (STOP)
Attwood, J.
Newton, Chambers and Co.
Trott, H.
Whitley Partners

VARNISH
Kershaw, J., and Co.

VENTILATORS
Boyle, R., and Son
Hayward Bros. & Eckstein
Messenger and Co.
Treggon and Co.
Wenham Co., Lim.

VICES
Macbriar, W. M.
Parkinson, J.
Schmidt, J. H.

VLCNITE GOODS
Moseley, D., and Sons

WASHERS
Anderson, Anderson & Anderson
Cotterill, F. W., Lim.
Fisher and Ludlow
Jardine, J.
Lomas and Co.
Periam, H. W.

WASHING MACH'Y
Empire Wringer Co.
Holmes, Pearson and Midgley

WEIGHING MACHINES & SCALES
Denison, S., and Son
Parkes, Z., and Co.
Wood, A., and Sons

WELL-BORING TOOLS
Richards, R., and Co.

WHEELBARROWS
Ash, J., and Son
Bayliss, Jones and Bayliss
Braby, F., and Co.
Brierley and Son
Davies Bros. and Co.
Ludlow Bros.

WICKS
Morgan, J., and Son

WINDMILLS
Williams, A., and Co.

WINE BINS
Benson, F.
Braby, F., and Co.
Brookes, Wm. and Co.
Burrow, W. and J.
Ramsey, S., and Co.

WIRE BRUSHES
Rhodes, B.
Riddell, Wm., and Co.
Rowat, A., and Co.
Taylor, Wm.

WIRE DRAWERS
Johnson, R., Clapham & Morris

WIRE MNFS.
Rollason and Slater

WIRE MATS
Felten and Guilleaume
Quitmann, F. and O.
Wale, T. E., and Sons

WIRE MATTRSSES
Chorlton, Isaac, and Co.
Gale, Geo., and Sons
Manchester Spring Mattress Co.
Peyton and Peyton
Siddall, R.
Wale, T. E., and Sons

WIRE NETTING MACHINERY
Bond, E. S.
Willmott Bros. and Cobon

WIRE NETTING
Boulton and Paul
Braby, F., and Co.
Croggon and Co., Lim.
Felten and Guilleaume
Hood, Joseph
Johnson, R., Clapham & Morris
Lawes, Ash and Co.
Lysaght, John, Lim.
Treggon & Co.
Walker Bros.

WIRE ROPES
Cradock, Geo., and Co., Lim.
Dixon and Corbitt
Midland Wire Cordge Co. Lim.
Shaw, John

WIRE WEAVERS
Brookes, W., and Co.
Dickson, James
Johnson, R., Clapham & Morris
Lawes, Ash and Co.
Ramsey, S., and Co.
Riddell, W., and Co.
Rowat, A., and Co.
Small, W.
Siddall, R.
Starkie, J.

WIRE WORKERS
Ackelman and Co.
Baker, Geo.
Brookes, W., and Co.
Clark, John
Cousland, A., and Son
Dickson, James
Johnson, R., Clapham & Morris
Lawes, Ash and Co.
Nichols, J., and Sons
Ramsey, S., and Co.
Riddell, Wm., and Co.
Rowat, A., and Co.
Small, W.
Stanier, John, and Co.
Starkie, J.
Thomas, J. J., and Co.
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WOOD ENGRAVRS
City Wood Engraving Co.
Commercial and Artistic Co.

WOOD WORKING MACHINERY
Booth Bros.
Churchill, Chas., and Co.
Green, Joseph, and Nephew
Lees, T. and R.
Scott Bros.
Sutcliffe, John, and Son
Wilson Bros.

WREATHS
André, Emile, et Frères

ZINC
Braby, F., and Co.
Treggon and Co.

ZINC WORKERS
Braby, F., and Co.
King, Jas., and Co.
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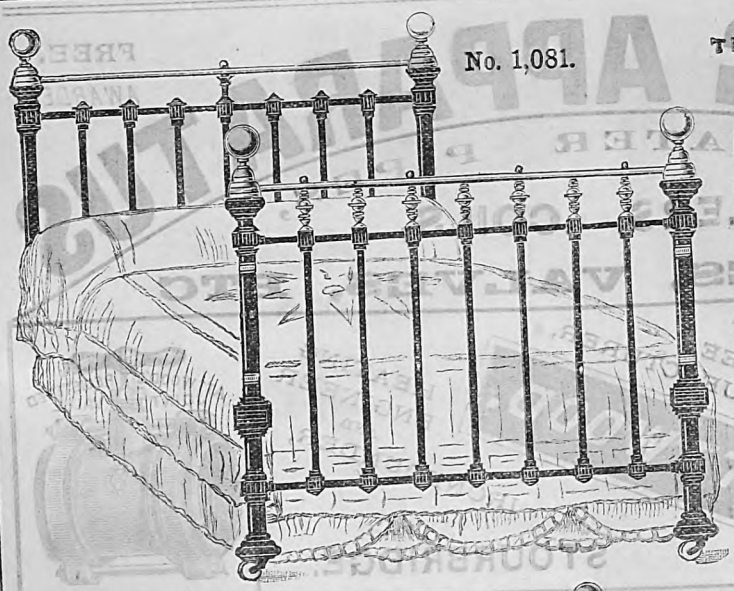
EVERED & COMPANY, LIM.

BEDSTEADS

REGISTERED TRADE MARKS "EVERED" RE &S



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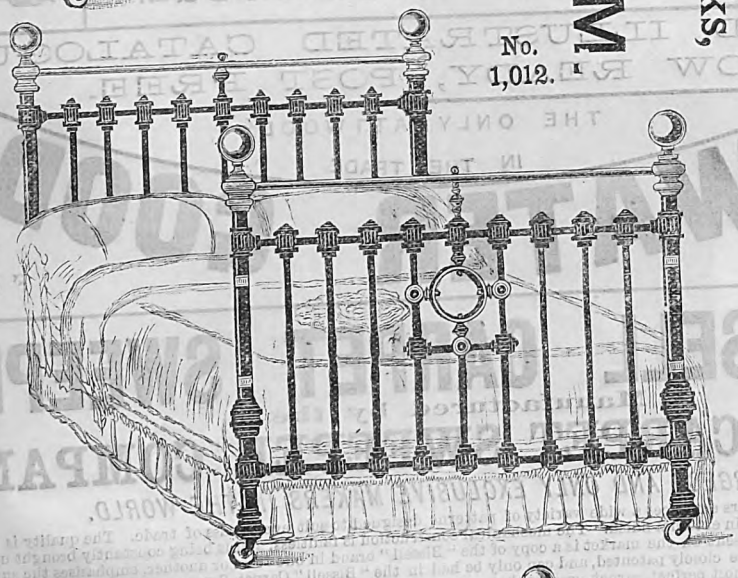

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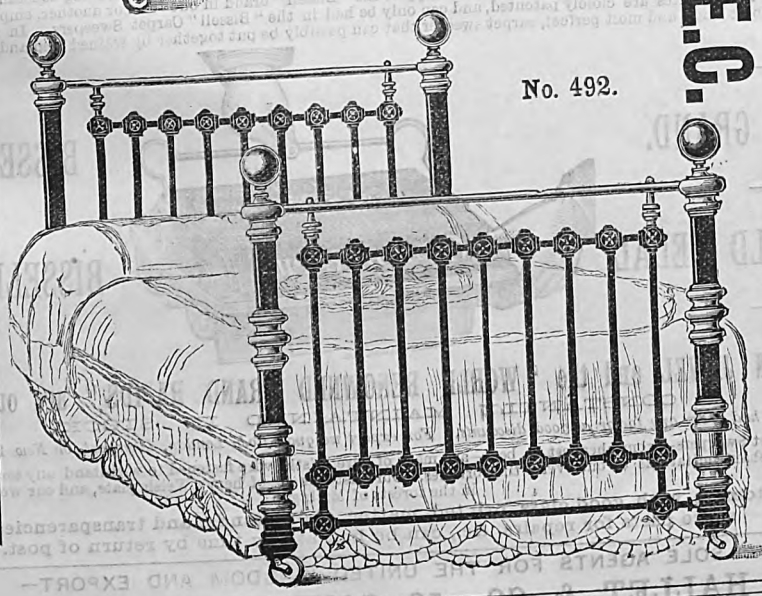

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BIRMINGHAM.

Factory—Surrey Works, SMETHWICK,

London Showrooms—50 HOLBORN VIADUCT, E.C.

BEDSTEADS OF EVERY DESCRIPTION.

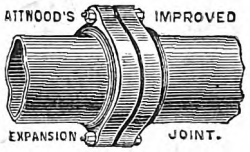
ILLUSTRATED CATALOGUES ON APPLICATION WITH TRADE CARD.

CATALOGUES FREE.
MEDALS AWARDED,

HEATING APPARATUS

HOT-WATER PIPES,
BOILERS, COILS,
COIL-CASES, VALVES, ETC

THE BEST JOINT.



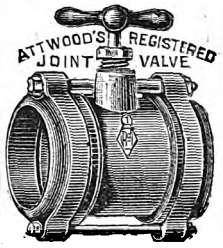
OVER A MILLION SOLD.

INVENTOR, PATENTEE, MANUFACTURER, &

J. ATTWOOD.

HEATING ENGINEER AND IRONFOUNDER,

STOURBRIDGE.



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NOW READY, POST FREE.

THE ONLY ATTWOOD
IN THE TRADE.

HOT-WATER GOODS.

MEDALS AWARDED.
CATALOGUES

THE BISSELL CARPET SWEEPERS,

Manufactured by the

BISSELL CARPET SWEEPER COMPANY,

THE LARGEST AND ONLY EXCLUSIVE MAKERS IN THE WORLD.

This celebrated line of Carpet Sweepers embraces a wide variety of patterns designed to suit every class of trade. The quality is uniformly *THE BEST* in all patterns, each differing only in external finish. The mechanical construction is faultless, and is being constantly brought up to date. The fact that every four-wheel sweeper at present on the market is a copy of the "Bissell" brand in one form or another, emphasises the superiority of the original article. All our new features are closely patented, and can only be had in the "Bissell" Carpet Sweepers. In buying the "Bissell" Carpet Sweepers you handle the best made, and most perfect, carpet sweeper that can possibly be put together by trained men and high-class plant.

BISSELL'S GRAND.

BISSELL'S ROYAL.

BISSELL'S GOLD MEDAL.

BISSELL'S SUPERIOR.

BISSELL'S CROWN JEWEL and the "WORLD RENOWNED GRAND RAPIDS" are our Standard Brands,
CONSTANTLY MAINTAINED IN STOCK.

The goods may be had from any factor at good discounts. For export we quote f.o.b. London, Liverpool, or New York, in free packages.

The brushes of our Carpet Sweepers—from cheapest to best—are made of pure bristle, wire fastened to withstand any temperature. Beware of cheap sweepers containing horsehair, imitations of our everlasting brushes. Our dustpans are of heavy Welsh plate, and our woods are among the finest cut in the forests of Michigan.

We supply all customers with good-class printed matter, show-stands, and transparencies, free of charge. All spare parts for repairs, &c., can be had at any time by return of post.

SOLE AGENTS FOR THE UNITED KINGDOM AND EXPORT—

FRANKLIN HALLET & CO., 52 CANNON STREET, LONDON, E.C.

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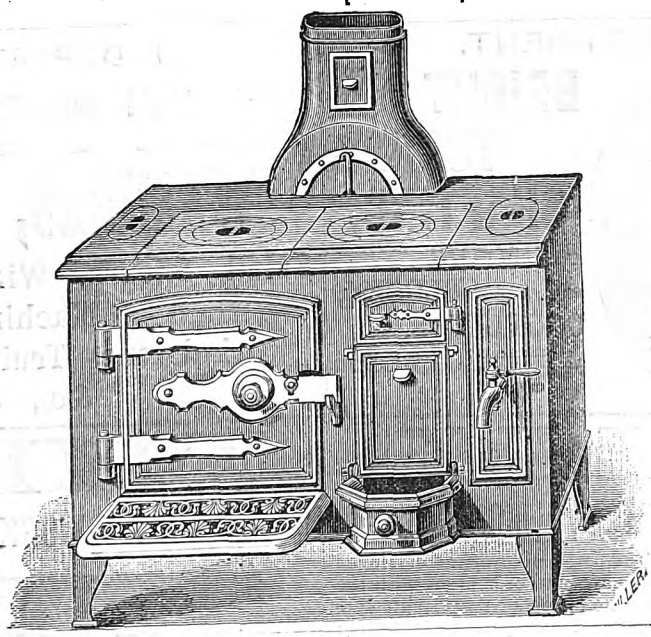
SPRINGFIELD FOUNDRY CO.

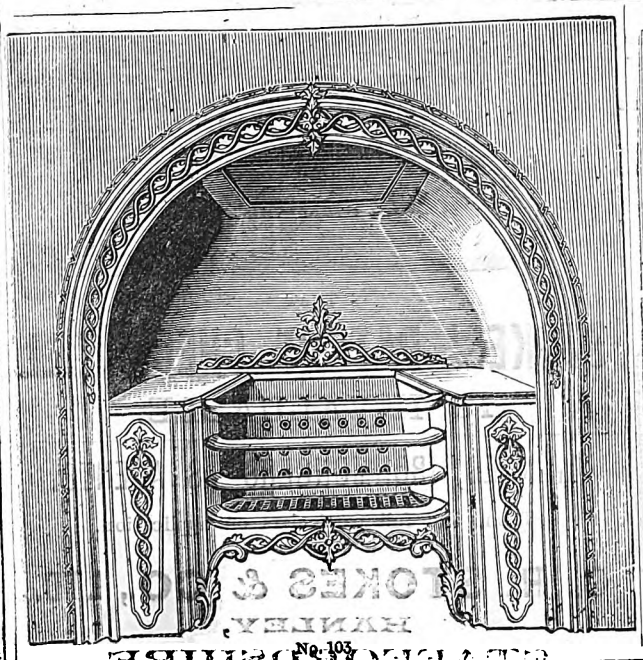
LONDON:
4 St. Mary Axe, E.C.

FALKIRK.

THE "SCOTTISH CHIEF."

The Best of Cooking Ranges. [1]





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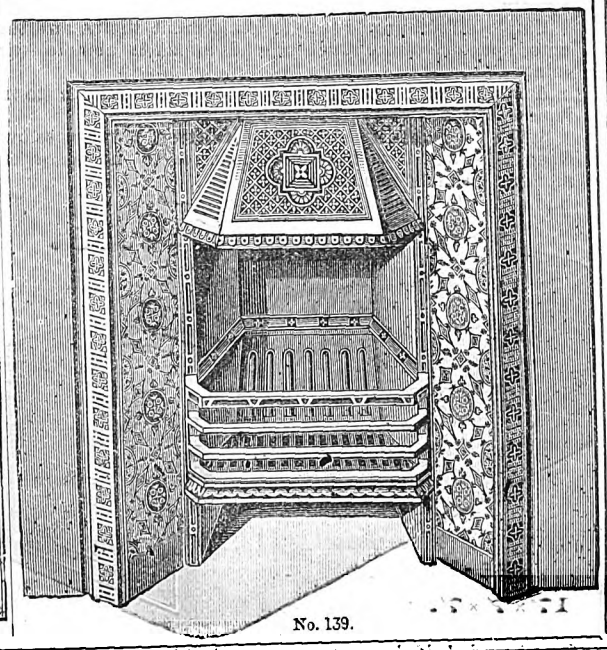


No. 139.

JOHN JARDINE,

NOTTINGHAM, ENGLAND.

Telegraphic Address—"JARDINE NOTTINGHAM." **Telephone—Number 295**

MANUFACTURER OF

A DEPARTMENT.

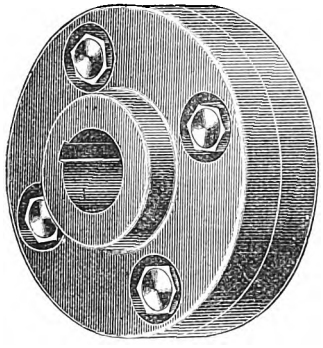
LEATHER MACHINE BANDS,
Hose Piping,
Pump Leathers, &c., &c.

G DEPARTMENT.

HARNESS, SADDLERY, &c.

(For Home, Colonial, and other markets).

B DEPARTMENT.



BRIGHT TURNED SHAFTING,
PLUMMER BLOCKS,
COUPLINGS,
PULLEYS,
&c., &c.

I DEPARTMENT.

BRIGHT TURNED STEEL WASHERS, SCREWS,

Small Shears, Wire Straightening Machines,
Grindstone Truing Machines,
&c., &c.

READ THIS!

1,000 SOLD IN TWELVE MONTHS. CAN BE SEEN AT WORK IN ALL TOWNS.

OPEN TILLS have ruined both employer and employed in numerous cases. Employer having to be content with the actual Cash in Drawer, having no means of detecting errors in giving change, or actual thefts—two important factors in success.

Employed yielding to temptation, commit thefts, and thus enter upon one of the roughest roads a man is heir to—viz., ruin.

A system of checking receipts can give offence to no honest person.

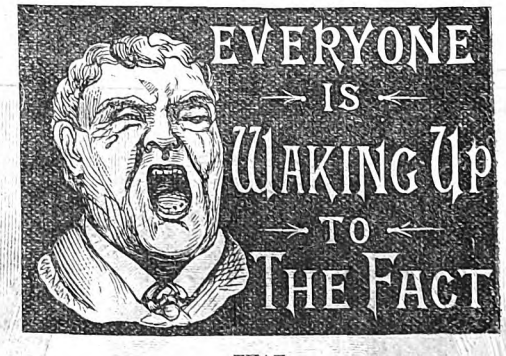
Stokes' system gives employers thirteen advantages over Open Tills, and thus the outlay incurred is the best-spent money a business man can spend.

Showing Till Closed and ready for use:—

£3.

SIZE—
17×7×7.

Occupies only half the counter-space required by all other systems.



THAT

STOKES' PATENT CHECK TILL IS INVALUABLE.

WANTED, IRONMONGERS AS AGENTS.

Terms and full particulars on application.

G. R. STOKES & CO., LTD.,
HANLEY,
STAFFORDSHIRE.

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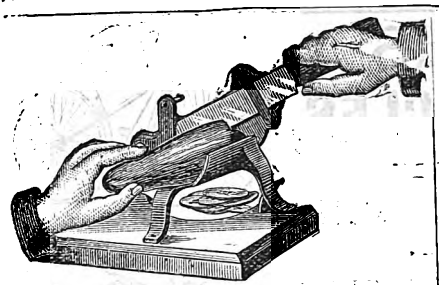
GEO. SALTER & CO.

Household Specialities.

TRADE MARK.

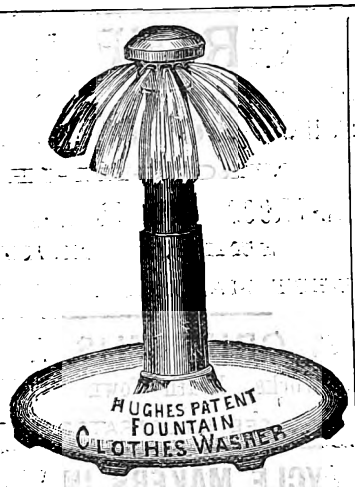


SLICING MACHINE.

For Slicing Cucumbers, Beet, Onions, &c. An ordinary table knife is used.

Price (without knife 2/3 each.

NOTE.—With Screw Adjustment to regulate thickness of slices.



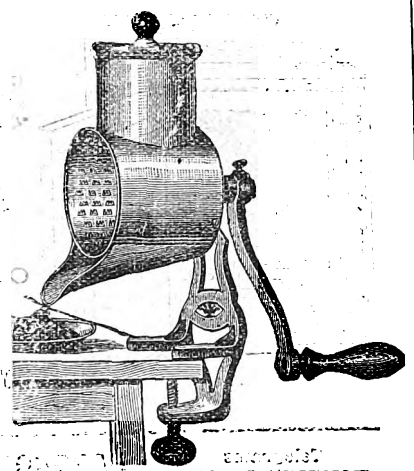
WASHING MACHINE.

Made of Zinc.

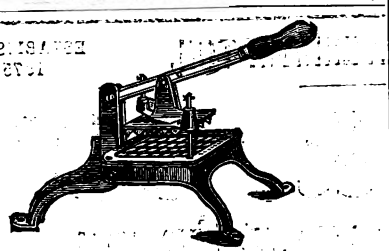
Simple and perfect in working.

No Brushing or Scrubbing needed.

Price 4/ to 8/ each.



GRATING MACHINE.

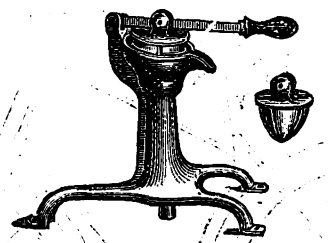


POTATO CHIP MACHINE.

A movement of the handle makes the Potatoes into chips ready for cooking.

Price 3/3 each.

Larger size, with spring at back to raise handle, 5/- each.

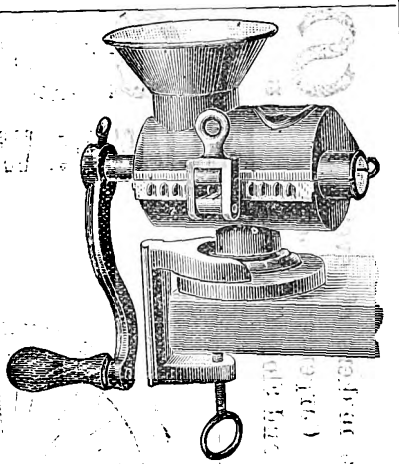


LEMON SQUEEZER.

Made in Cast Iron.

The Cup is lined with Enamel, which is specially prepared to resist acid.

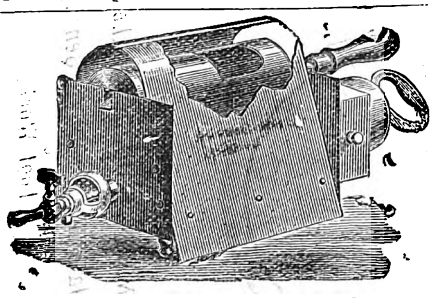
Price 4/6 each.



"VICTORIA" MEAT MINCER.

The inside of the Machine is coated with white Enamel. All the Cutters are steel, and treble-edged.

No. 1, price 8/ each.



COFFEE ROASTER.

GOODS SUPPLIED THROUGH FACTORS AND MERCHANTS.

WEST BROMWICH

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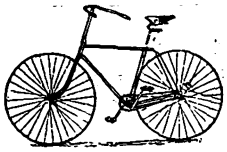
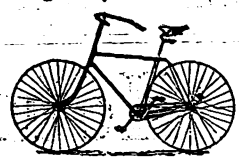
EVERY IRONMONGER CAN MAKE MONEY

By handling these Machines.

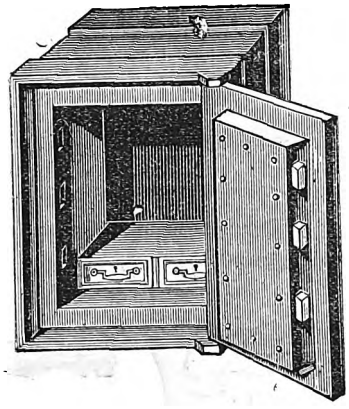


Prices from £6 Net.
Weights from 26 lbs.



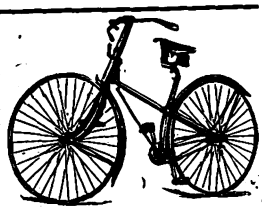
W. COOTE REYNOLDS,
Devonshire St., LONDON, W.C.
Telegrams—"IMP LONDON."

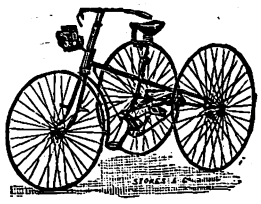
LATEST PATTERNS!!
LATEST IMPROVEMENTS!!!
Enclose Trade Card for Wholesale List.



GRIFFITHS' UNIVERSAL CYCLES,

WROUGHT-IRON
FIRE-PROOF AND THIEF-PROOF SAFES,
STEEL TRAPS.
OLDEST MAKERS IN THE WORLD.





S. GRIFFITHS & SONS,
Clyde Works, Heath Town, WOLVERHAMPTON
SEE ILLUSTRATED LISTS.

Telegrams "GOODBY WOLVERHAMPTON"

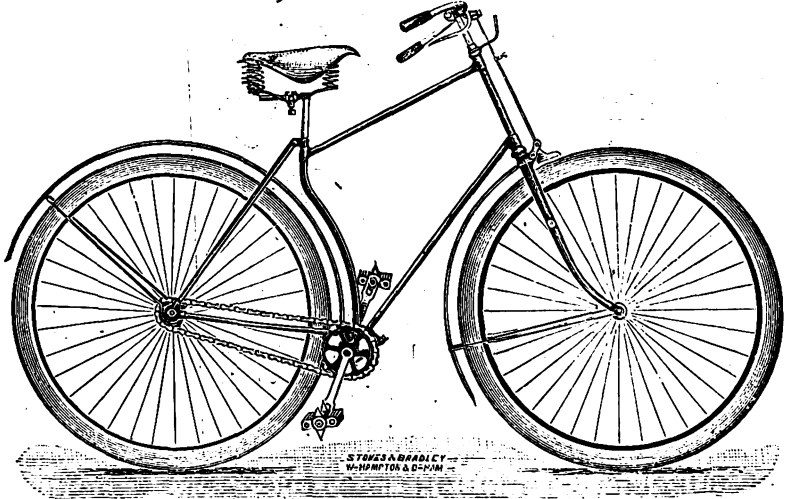
LARGEST CYCLE MAKERS IN WOLVERHAMPTON.

ESTABLISHED 1875.

S. GOODBY & SON

RELIANCE WORKS, PETIT STREET, WOLVERHAMPTON.

S. G. & Son are makers of every description of Carpenters' and Joiners' Bench and Floor Cramps.



PLEASE NOTE—S. GOODBY is the only SON of the late S. GOODBY, Senr., Herrick Tool Works.

DIAMOND FRAME SAFETY, BALL STEERING, LIST PRICE £10.
If fitted with Cushion Tyres, as above, extra.

For CHEAPNESS, combined with DURABILITY & STRENGTH, our Goods are unequalled.

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GEORGE BUTLER & CO.'S SHEFFIELD CUTLERY

TRINITY WORKS, (SPECIAL). EYRE STREET, SHEFFIELD.

EXTRA QUALITY

REGISTERED TRADE MARK — SPECIAL CAVENDISH BRAND — FIRST QUALITY ONLY

"CAVENDISH" CUTLERY.

(SPECIAL BRAND, REGISTERED.)

All Hand Forged, Hardened and Tempered by First Prizemen, from EXTRA QUALITY Steel, and set ready for use by a New Process.

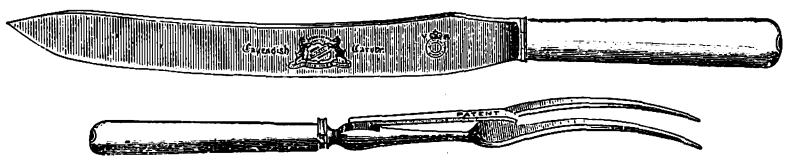
THE DEMAND FOR

The Famous "CAVENDISH" Brand has become most popular; its high quality, style, and finish obtained special mention Newcastle, 1887, and at Melbourne, 1888, First Order of Merit.

The Leading Hardware Journal says :—

The "CAVENDISH" will be particularly welcome to those who dislike large and heavy Cutlery at Table. In this new registered brand the sizes are very symmetrical, and at once assert themselves as the most elegant yet introduced.

CABINETS AND CASES OF



CUTLERY AND PLATE.

The Carvers are novel in outline; the Fork is of special shape, fitted with new safety guard (Registered), giving a full grip of the joint, and affording every facility for easy and rapid carving.

The Dinner Knives as well as Carvers are a luxury for the table, always keeping a sharp edge.

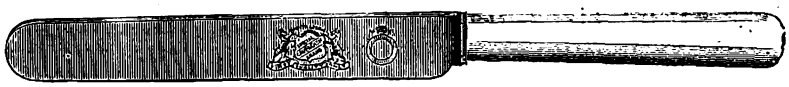
IVORY SECURE HANDLES (BALANCE)

QUALITY CONSIDERED, THESE ARE THE CHEAPEST KNIVES IN THE MARKET.

Patterns with more elaborate and costly handles (both Ivory and Pearl) are made, but in all cases the quality of the Steel used for the blades is the same.

The Famous "KEEN" Razors.

No. 28.



No. 29.

No. 30½.

Spoons & Forks. Fish Eaters and Desserts. Pocket & Sporting Knives. Scissors, &c.

"CAVENDISH" STAG-HANDLED CARVERS, STEELS, &c.

"CAVENDISH" CARVERS IN SILK LINED CASES, SUITABLE FOR PRESENTATIONS, &c.

"CAVENDISH" is a Registered Trade Mark for HIGH QUALITY, ELEGANCE, and FINISH.

LONDON SHOW ROOM, 62 HOLBORN VIADUCT, E.C.

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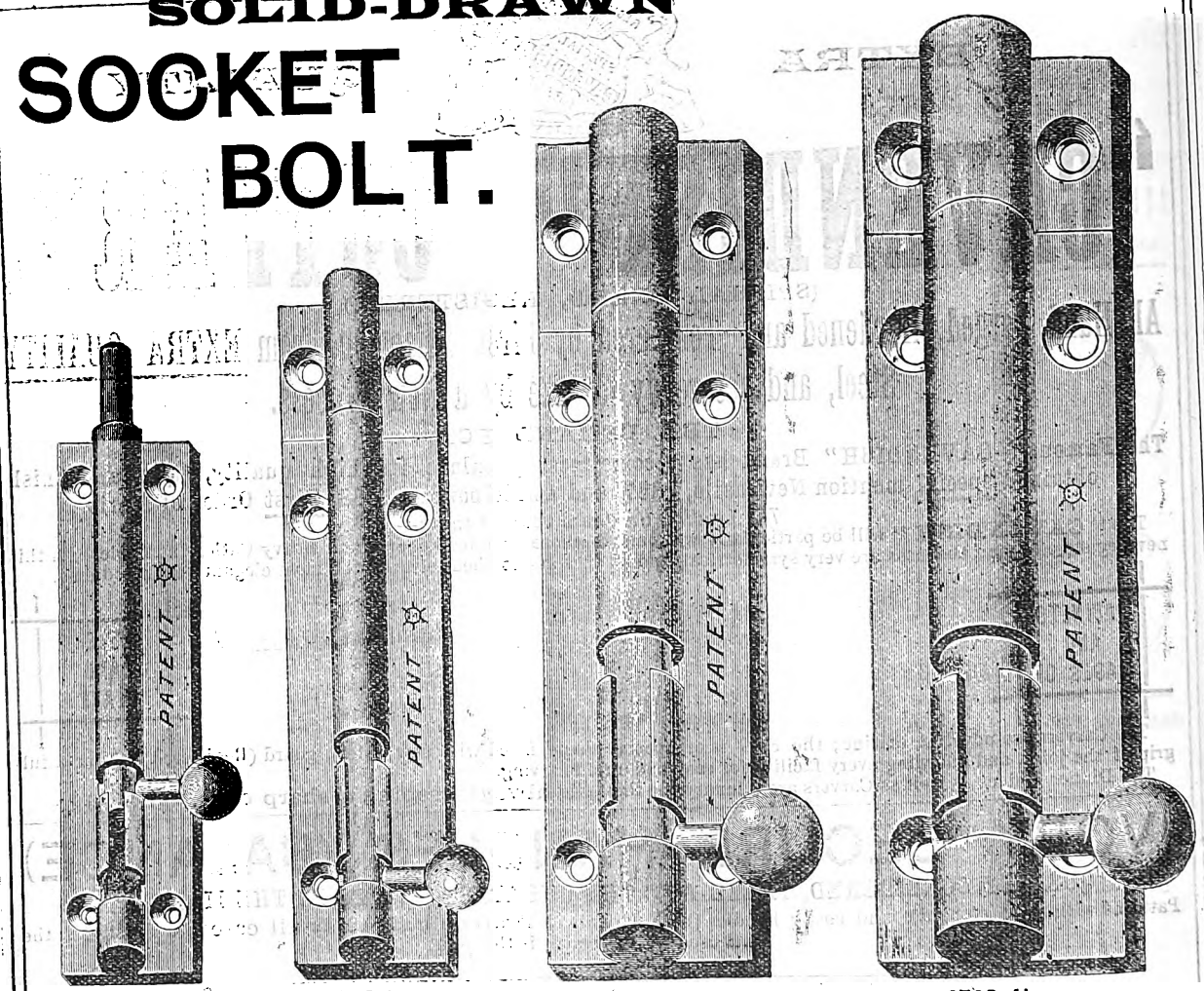
TONKS' PATENT MACHINE-MADE SOLID-DRAWN SOCKET BOLT.



8782, 3 in. 8783, 3 in. 8785, 3½ in. 8786, 4 in.

OTHER SIZES—8787, 1⅝ in. wide; 8861, 2⅛ in. wide.

No Bolts Genuine unless marked PATENT

Made in all regular sizes up to 60 inches, and longer if necessary.

ADVANTAGES.

STRONGEST AND BEST BOLT IN THE MARKET.
SOLID WIRE CUT KNOB.
WILL NOT BREAK.

	Screws.
8782	No. 3
8783	„ 5
8785	„ 7
8786	„ 10
8787	„ 12
8861	„ 12

ADVANTAGES.

ALL SCREW HOLES UNIFORM IN SIZE.

AVOID SPURIOUS IMITATIONS.

TONKS, LIMITED, LATE W. TONKS & SONS, **BIRMINGHAM**

London Offices and Showrooms—57 Holborn Viaduct, E.C.

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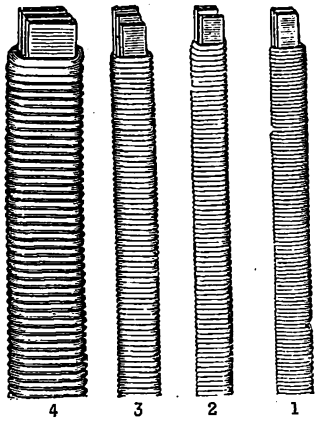
TONKS (LIMITED), BIRMINGHAM.

HOOKHAM'S PATENT STEEL PIANO-WIRE PICTURE LINE.

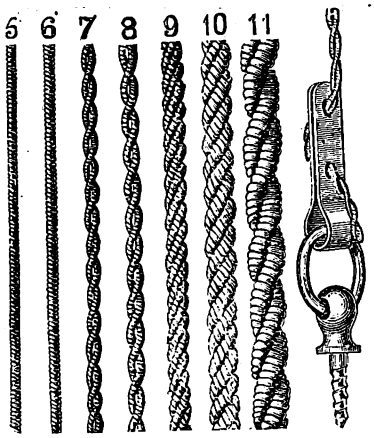
The Line is made with a Core of Steel Piano Wire of the best quality, and will support a great strain for almost any length of time. The Core is protected from Rust by a binding of Waterproofed Cotton; over this is a covering of Ormolu Wire, which, being well lacquered, will keep its colour.

HOOKHAM'S PATENT STEEL RIBBON SASH LINE.



Sold in 100 Feet Lengths only.

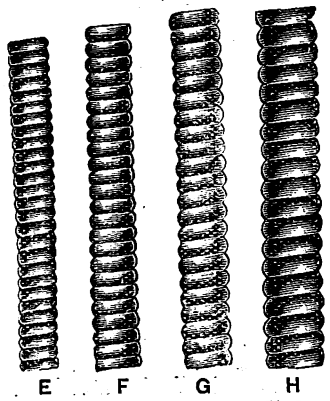
No.	For sashes up to	Price per ft.
1.	40 lbs.	2d.
2.	75 „	3d.
3.	150 „	4d.
4.	heavier	7d.



500,000 PICTURES HUNG BY THIS LINE IN 1889.

Line	Per 100 ft. Coil.	Fstnrs. Per gross
5	3/6	2/-
6	5/-	2/-
7	8/6	3/-
8	12/-	4/-
9	20/-	5/-
10	35/-	8/-
11	60/-	13/-

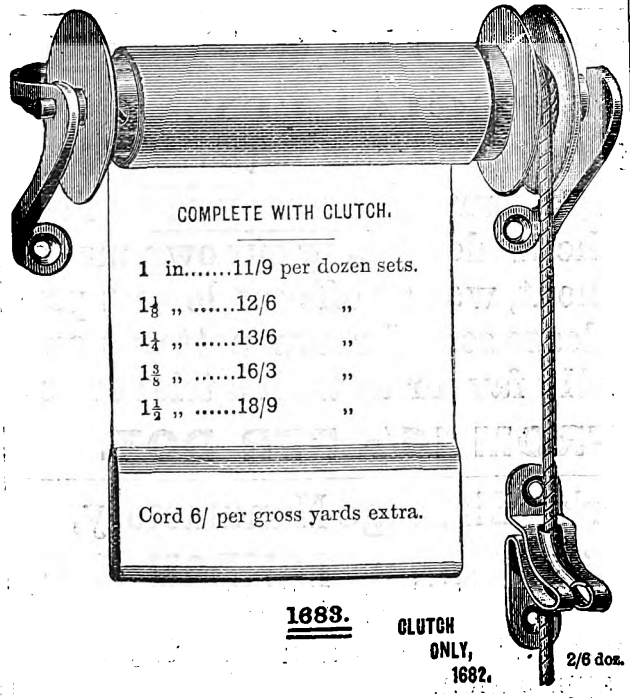
HOOKHAM & TONKS' PATENT METAL-PROTECTED WATERPROOF SASH CORD.



No.	For sashes up to	5/- doz. yds.
E	½ cwt.,	
F	½ „	7/3 „
G	1 „	9,9 „
H	1½ „	12/6 „

PATENT "TENAX" BLIND FURNITURE.

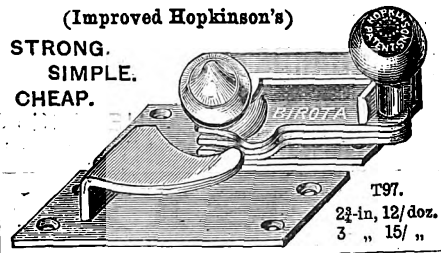
The "Tenax" Clutch is the simplest and most effectual Holder which has been as yet contrived for all kinds of lines which have to be regulated in length from time to time, but more especially the lines of all varieties of blinds, both light and heavy.



PATENT "BIROTA" SASH FASTENER.

(Improved Hopkinson's)

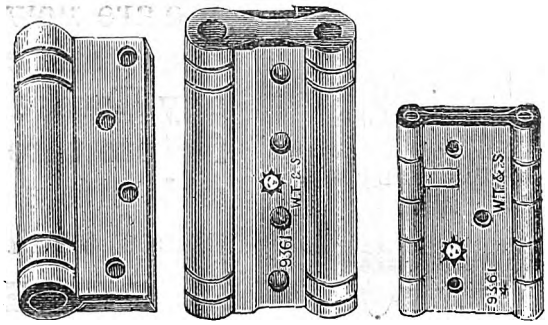
STRONG.
SIMPLE.
CHEAP.



The Arm Protected by Steel Plate.

T97.
2½-in, 12/doz.
3 „ 15/ „

PATENT HELICAL SPRING HINGES.



9362.—Single Action. 9361.—Spring Hinge. 9361.—Plain.

Size of Door.	SINGLE ACTION. With Steel Washers. 9362. With knob.	DOUBLE ACTION. With Steel Washers. 9361.	Spring Hinge only.
3 in.	2/- each	2/6 each.	
3½ „	2/6 „	3/- „	
4 „	3/- „	3/6 „	
5 „	3/9 „	4/3 „	
6 „	4/6 „	5/- „	
7 „	11/- „	11/6 „	
1 & 1¼,		3 in. 6/6 set	4/9 each.
1 to 1½,		3½ „ 8/3 „	5/10 „
Counter.			
1½ to 1⅝.		4 „ 10/- „	7/- „
2 in.		5 „ 13/9 „	9/6 „
2¼ „		6 „ 15/3 „	10/6 „
2½ „		7 „ 23/- „	—

LONDON OFFICES AND SHOW ROOMS: 57, HOLBORN VIADUCT, LONDON, E.C.

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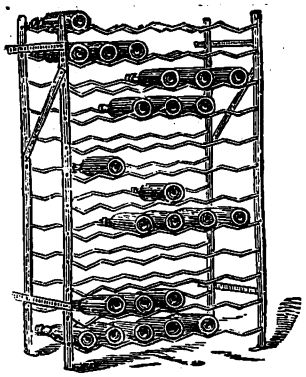
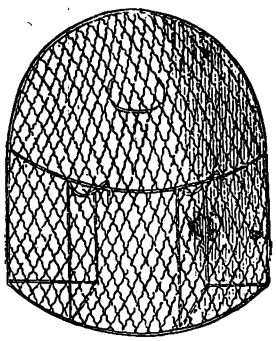
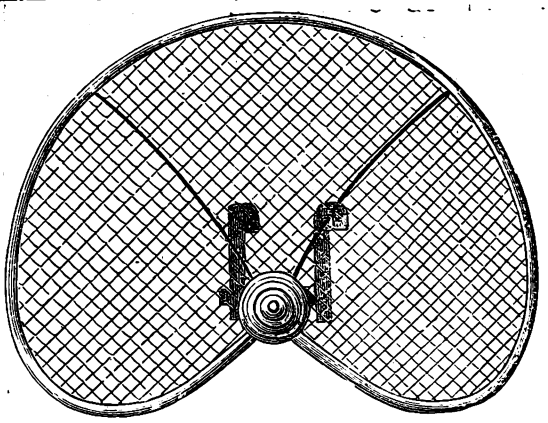
S. RAMSEY & CO.'S SEASON'S GOODS.

Telegraphic Address:—"METHODICAL LONDON."

LOW PRICES! PROMPT DELIVERY!



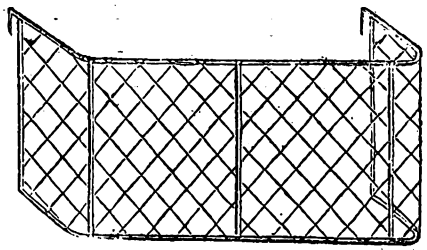




Greatly Reduced Prices. Winter Season, 1890. Send for Reduced List of Season's Goods.

PORTABLE IRON WINE BINS.
OUR OWN MANUFACTURE.
Prices from 9d. per doz. bottles.

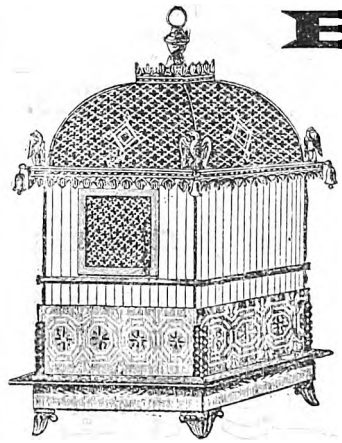
NURSERY GUARDS.
SPARK GUARDS.
KITCHEN GUARDS.



CHEAP KITCHEN GUARDS.
Special Low Price.

BRASS FIRE SCREENS.
SPECIAL CHEAP LINES.
Prices from 1s. 6d. each.

FOLDING FIRE SCREENS.
SIEVES & SCREENS.
WIRE TRELLIS.
WINDOW BLINDS
(Venetian, Wire, and Zinc).



BIRD CAGES,

A SPECIALITY.

We are now introducing new patterns in Bird Cages, and can guarantee a larger variety than any House in the trade. Being our own manufacture throughout, we can offer at lowest possible prices. Please send for new patterns and prices, and kindly favour us with a trial order.

PRICE FROM 16/- PER DOZ.

Clerkenwell Iron & Wire Works, Birdcage Manufactory,

198, 200, & 202A ST. JOHN STREET, LONDON, E.C.

N.B.—Illustrated Catalogue of general Wire Goods and Bird Cages post-free on application.

A TRIAL ORDER RESPECTFULLY SOLICITED.

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THE NEW SUBSTITUTE FOR IVORY.

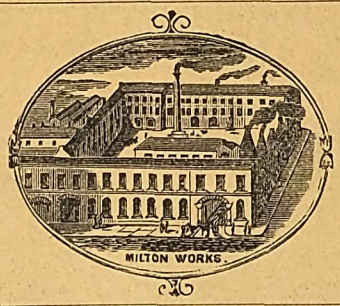
TABLE KNIVES, WITH IVORY-GRAINED CELLULOSE, (OR IVORIDE,) HANDLES,

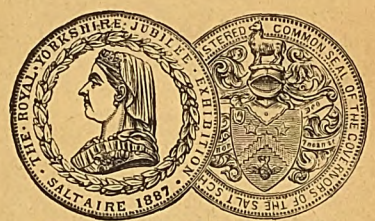
Manufactured by ATKINSON BROS., Milton Works, SHEFFIELD,

Manufacturers of Files, Steel, Saws, Edge Tools, and Cutlery,

ARE HAVING AN IMMENSE SALE, UPWARDS OF 20,000 DOZEN SOLD LAST YEAR.

THE SILVER MEDAL AWARDED AT THE BRUSSELS INTERNATIONAL EXHIBITION, 1888.





THE ONLY AWARD FOR CUTLERY AT ABOVE EXHIBITION, 1887.

"THE IRONMONGER" of January 29th, 1887, says:

IVORY Substitute for Knife Handles.—In its most improved form cellulose (or ivoride) is asserted to possess all the beauty and virtues of ivory, with something else to boot. The new grained cellulose (or ivoride,) such as is used by Atkinson Brothers, Milton Works, Sheffield, is equal in appearance to ivory. It has the creamy purity of ivory, the delicate softness to the touch, and the lightness in handling. It is as hard as steel and as tough as leather. Ladies will hear with pleasure that it stands water better than ivory, bone, or any other substance, and that, as it does not absorb grease, there is no excuse for sending cellulose-handled knives to the table in an unclean condition. Already their cellulose (or ivoride) table-knives and carvers, with blades of the finest tempered steel, are having a call in the market.

No. 5376 in Cellulose (or Ivoride).

No. 5659 in Cellulose (or Ivoride). No. 5659½ in Ivory.

CELLULOSE, (OR IVORIDE.)

No.	Size Blade.	Size Handle.	Description.	Per Dozen Table Knives.	Per Dozen Desserts.	Per Pair Carvers.
5376	5¼	3⅝	White Cellulose, (or Ivoride.)—Egg Waterloo, Candle End	5/9	5/6	2/6
5679	,,	,,	Grained ,, ,, ,, ,, ...	7/6	7/0	2/11
5905	,,	,,	,, ,, ,, ,, ,, ,, through tang	7/9	7/3	3/0
5620	,,	,,	,, ,, Oval Hollow London Octagon	7/6	7/0	2/11
5377	,,	,,	White ,, ,, ,, ,, ,, ...	6/10	6/3	2/10
5705	,,	,,	Translucent ,, ,, ,, ,, ...	7/0	6/6	2/6
5678	6	4	Grained ,, Egg Waterloo, Candle End	9/6	7/6	3/0
5904	,,	,,	,, ,, ,, ,, ,, ,, through tang	9/10	7/9	3/2
5903	,,	,,	Translucent ,, ,, ,, ,, through tang	9/3	7/3	3/1
5619	,,	,,	White ,, ,, ,, ,, ...	8/6	6/6	2/8
5706	,,	,,	Translucent ,, ,, ,, ,, ...	9/0	7/0	2/10
5659	6¼	4	Grained ,, Oval Hollow London Octagon	9/10	8/10	3/10
5203	,,	,,	Translucent ,, ,, ,, ,, ...	9/6	7/6	3/0
5707	,,	,,	White ,, ,, ,, ,, ...	8/6	6/6	2/8
5707½	6	3¾	Grained ,, ,, ,, ,, ,, ...	8/3	7/6	2/8
			No. 5624 .. Bread Knife, Grained .. 16/6 per dozen.			

BONE.

No.	Size Blade.	Size Handle.	Description.	Tables. Sets C. F.	Tables. Sets S. F.	Tables. Dozs.	Desserts. Sets. C. F.	Desserts. Sets. S. F.	Desserts. Dozs.	Carvers. Per Pair.
6005	5¾	3½	Soft Bone.—Square Handles	3/11	5/9	2/9	3/8	5/3	2/6	1/8
5830	5¾	3⅝	White Bone.—Oval Hollow London Octagon, Balanced	6/3	7/8	4/6	5/8	7/0	3/9	1/11
5831	5¾	3⅝	,, ,, Egg Waterloo, Candle End, Balanced	6/3	7/8	4/6	5/8	7/0	3/9	1/11
5832	5¾	3⅝	,, ,, Square ,, London Octagon, Balanced	6/3	7/8	4/6	5/8	7/0	3/9	1/11
5832½	6¼	4	,, ,, Oval Hollow Round Head Octagon, Edge Pinned, Balanced ..	9/9	11/5	6/10	7/0	8/6	4/6	2/8
5833	4¾	3¼	Superior Bone.—Yankee Candle End, Balanced..				6/0	7/6	4/0	2/1
5834	4¾	3¼	,, ,, Egg Waterloo End, ,, ...				6/0	7/6	4/0	2/1
5835	4¾	3¼	,, ,, Oval Hollow End ,, ...				6/0	7/6	4/0	2/1
5836	5½	3⅜	Strong Hard Bone.—Oval Hollow London Octagon, Balanced	7/2	8/6	4/10	6/4	7/9	4/3	2/3
5837	5½	3⅜	,, ,, ,, Egg Waterloo, Candle End ,, ...	7/2	8/6	4/10	6/4	7/9	4/3	2/3
5838	5¾	3½	Hard Bone.—Oval Hollow London Octogan, not Balanced	6/10	8/4	4/7	6/0	7/3	4/0	2/3
5839	5¾	3½	,, ,, Square Waterloo ,, ,, ,, ,, ...	6/10	8/4	4/7	6/0	7/3	4/0	2/3
5843	6	3¾	,, ,, Oval Hollow Candle End, Edge Pinned, Balanced		12/0	7/0		9/4	5/0	2/9
5844	5¾	3¾	,, ,, Waterloo, Moulded ,, ,, ,, ...		12/0	7/0		9/4	5/0	2/9
5845	5¾	3¾	,, ,, Egg Waterloo, Candle End ,, ,, ,, ...		12/0	7/0		9/4	5/0	2/9
5848	7½	4¼	,, ,, Egg Waterloo, ,, ,, ,, ,, Breadknife			15/9				

SPECIAL LINES IN IVORY.

In order to reduce our very large Stock of Ivory Handles, we offer the following Nos. at very Low Prices, viz.:—

	Size Blade.	Size Handle.		Tables.	Desserts.	Carvers.
No. 5659½ Ivory	6¼	4	Ivory Edge Pinned	24/6 ℔ dz.	16/6 ℔ dz.	7/6 ℔ pair.
No. 5620½ ,,	5¼	3⅝	,, ,, ...	19/6 ,,	14/0 ,,	6/10 ,,

Owing to the recent great Increase in the Price of Ivory, the Prices of above Nos. must be largely increased after our present Stock of Ivory Handles is Sold.

ATKINSON BROTHERS, MILTON WORKS, SHEFFIELD.

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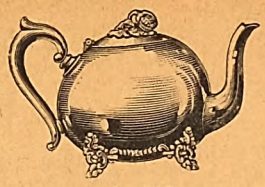
No. 220,
Britannia Metal Tea Pot,
4 gills, 1/11 each.

No. 221,
Britannia Metal Tea Pot,
1 2 3 4 5 6 gills.
2/7 2/10 3/2 3/6 3/10 4/3 each



No. 222,
Britannia Metal Tea Pot,
1 2 3 4 5 6 gills.
3/4 3/8 4/- 4/4 4/9 5/6 each.

No. 223,
Britannia Metal Tea Pot,
1 2 3 4 5 6 gills.
2/10 3/2 3/6 3/10 4/3 4/6each.

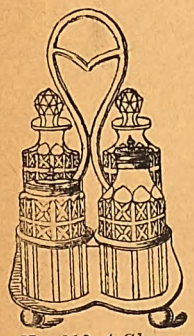
No. 224 4 5 gills.
E.P. Coffee Pot, 5/- 5/6 each.
E.P. Tea Pot, 4/4 5/4 each.
E.P. Sugar, 2/11 each.
E.P. Cream, 1/11 each.

No. 225, 4 5 gills.
E.P. Coffee Pot, 4/2 4/11 each.
E.P. Tea Pot, 4/- 5/2 each.
E.P. Sugar, 2/10 each.
E.P. Cream, 1/8 each.

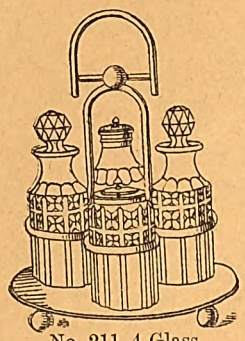
No. 226,
E.P. on B.M. Teapots.
1 2 3 4 5 6 gills.
2/4 2/8 3/- 3/4 3/9 4/6 each.
E.P. on B.M. Coffee Pots.
1 2 3 4 5 6 gills.
2/9 3/1 3/5 3/9 4/3 5/- each.
E.P. on B.M. Sugar, 1/9 each.
E.P. on B.M. Cream, 1/6 each.

No. 227,
Britannia Metal Teapot,
1 2 3 4 5 6 gills.
1/5 1/8 2/- 2/4 2/9 3/2 each.

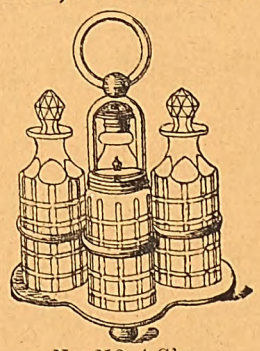
Electro-Plated Cruets on Nickel Silver, with Cut Glass Bottles.



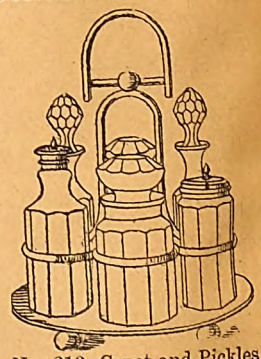
No. 210, 4 Glass,
10/6 each.



No. 211, 4 Glass,
11/4 each.



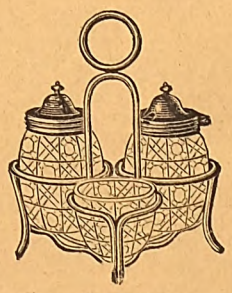
No. 212, 4 Glass,
11/4 each.



No. 213, Cruet and Pickles
10/8 each.

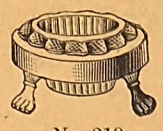
No. 215,
Biscuit Box, 4/8 each.

No. 216,
Biscuit Box, 4/8 each.

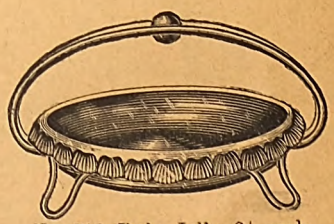


No. 214,
Breakfast Cruet, 2/8 each.

No. 217, E.P. Butter, 4/6 each.



No. 219,
Ruby Salt, 1/4 each.



No. 218, Ruby Jelly, 3/- each.

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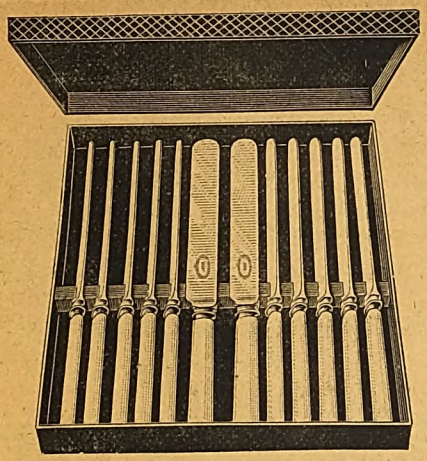


Illustration showing Rack Paper Case for Table Knives. Any Knives put up in these boxes, 3d. per doz. extra.

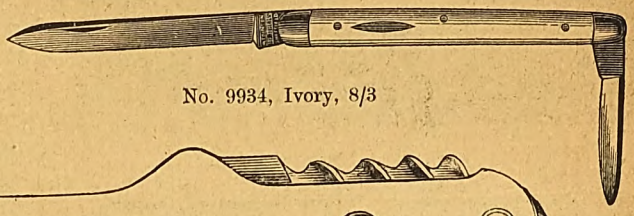
Meat or Stick Chopper, Solid Steel.

No. 12001, Thro' tang, 3/11 doz.
Ditto, larger, 4/3 doz.

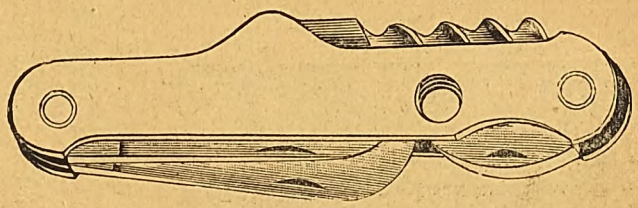
No. 12598, 4/3 card of 1 dozen.

	3¼	3½	3¾	4in.
No. 1073,	5/3	5/8	6/-	7/- doz.

No. 12647, 2/6 card of 1 doz.



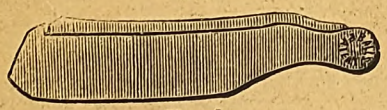
No. 9934, Ivory, 8/3



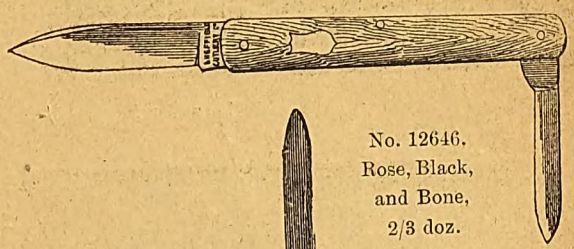
No. 7921, Champagne Knife, 9/6 doz.

Patent Pocket Razor, 18/- doz.

Open.

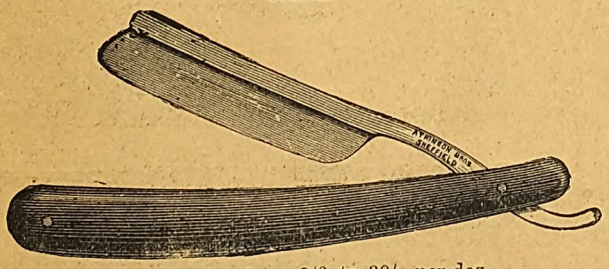


Closed.

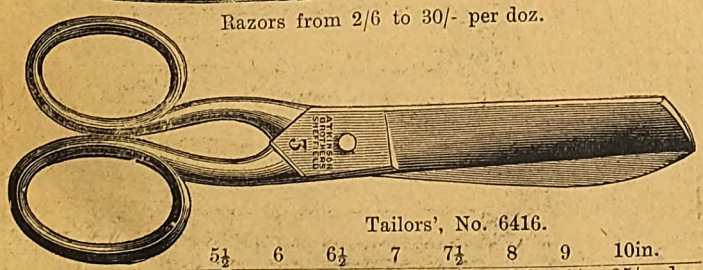


No. 12646.
Rose, Black, and Bone,
2/3 doz.

No. 8289, 3¼in., G.S. Bolsters, and Brass Lined.
2-Blades, Rose, 4/0. Do. 1-Blade, 3/4 doz.



Razors from 2/6 to 30/- per doz.



Tailors', No. 6416.

5½	6	6½	7	7½	8	9	10in.
6/6	7/-	7/9	9/6	11/6	13/6	20/-	25/- doz.

Nos. 1	2	3	4	5	6	7	8	9	10	11	12
7/10	6/-	6/3	7/10	4/6	3/9	3/2	3/3	4/3	4/9	6/3	10/9 dz.

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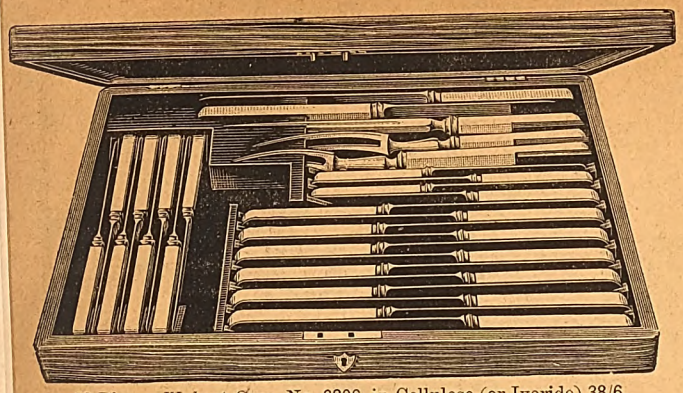
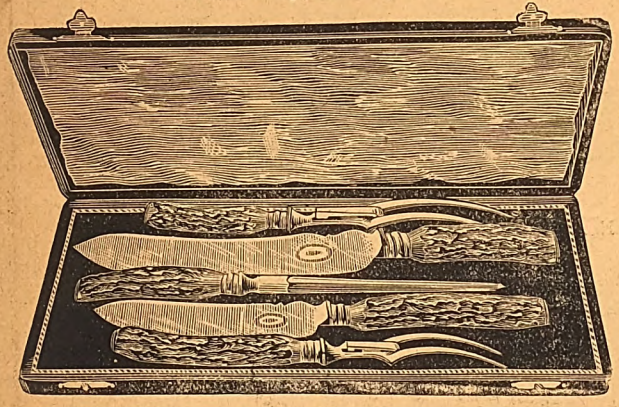
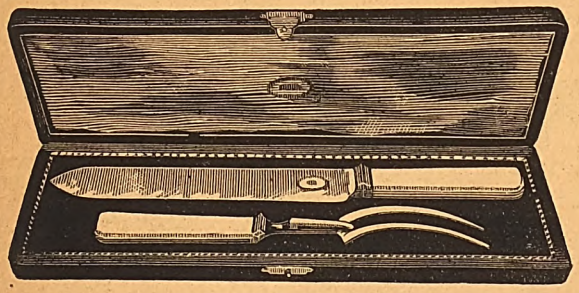


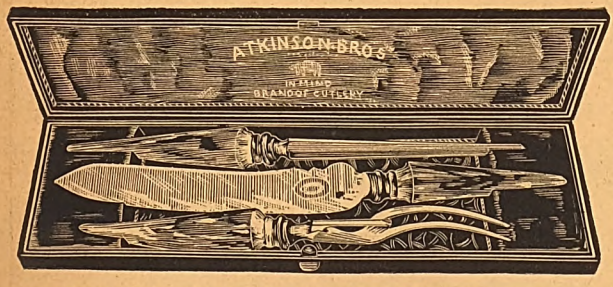
29 Pieces, Walnut Case, No. 6206, in Cellulose (or Ivoride) 38/6.
In 4-inch Ivory, No. 6209, 69/6.



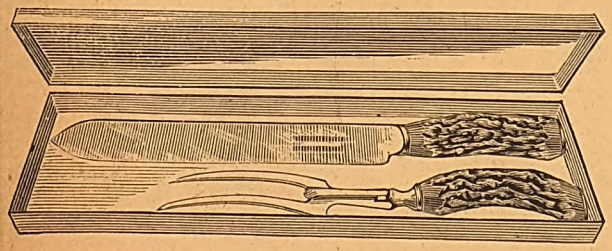
6044, Shear Steel Blade, Velvet Case, 14/6 Case.



2 Pieces, Velvet-Lined Case, No. 6084, in Cellulose (or Ivoride) 5/-,
In Ivory, No. 6211, 8/6.



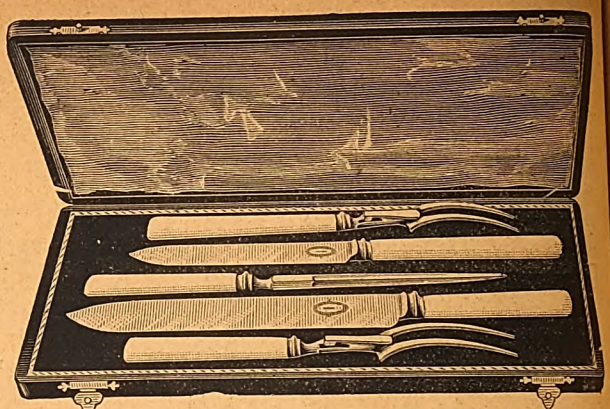
6351, Self-tip, Plush Case, Shear Steel Blade, 12/- each.



6359 (Paper box) 11½ in. Blade, Stag handles, 2/11 pair.

THE "IRONMONGER," OF AUGUST 9TH, 1890, SAYS:—

"Atkinson Brothers are engaged at the present time in the completion of orders for case goods, in view of the demand on dealers at Christmas time. The newest goods in this department comprise full sets of knives, forks, carvers, fish eaters, etc., hafted in cellulose or ivoride, which, although placed on the market at exceedingly low prices, are remarkable specimens of Sheffield's cutlery. At least 650 of these cases have been ordered so far this season, and an immense trade looked for in the immediate future. The cases themselves are in polished walnut, mahogany, and oak, and one could almost shave with the knives made out of the best shear steel. The demand for this class of goods is almost greater than Messrs. Atkinson, with all their power of production, can promptly meet. While the home markets all round are doing well this season for the firm, substantial orders are arriving from Australia and South Africa. The run on novelties has been noteworthy of late, but at the same time the demand for general cutlery keeps well up.



5 Pieces, Velvet Lined Case. No. 6207, in Cellulose (or Ivoride) 12/6.
In Ivory, No. 6210, 19/9.

6227, Shear Steel Blade, Velvet Case, 4/6 each.

Silver-Plated Fish Carvers, in Plush Lined Case, 10/6.
in Cellulose (or Ivoride) No. 6208. 12/6 in Ivory, No. 6212.

6221, Bone, Plated Caps and Ferrules, Shear Steel Blade, 12/6 each.

6076, Cellulose (or Ivoride) Velvet Case, 7 Pieces, 19/6 each.

ATKINSON BROTHERS, MILTON WORKS, SHEFFIELD.

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ATKINSON BROTHERS, Export & Import Merchants, 1, Graham St., Birmingham.

HAVE THE FOLLOWING SPECIALTIES IN STOCK.

Registered at Stationers' Hall. No. 23,000.

FRENCH PATTERN.

	Gross.
No. 110, Brit. Metal, Wired, Table Spoons	16/6
,, Do., Forks	16/6
,, Do., Dessert Spoons	14/-
,, Do., Do. Forks	14/-
,, Do., Tea Spoons	7/10
,, Not Wired, Do.	7--
,, Salt or Mustard	6/6

	Gross.
If Shell Fancy, No. 111,	17/-
Do., Do.,	17/-
Do., Do.,	14/6
Do., Do.,	14/6
Do., Do.,	8/-

FIDDLE PATTERN.

	Gross.
No. 112, Brit. Metal, Wired, Table Spoons, stronger	22/-
,, Do., Forks	22/-
,, Do., Dessert Spoons or Forks	19/-
,, Do., Tea Spoons, large	10/-
,, Do., Do., small	8/9
,, Not Wired, Tea Spoons	8/-
,, Salt or Mustard	9/-

BEADED PATTERN.

	Gross.
No. 113, Brit. Metal, Wired Table Spoons or Forks	27/-
,, Do., Dessert Spoons or Forks	22/6
,, Do., Tea Spoons	12/-
,, Salt or Mustard	9/-

Special Strong, Wired, for country use, in Fiddle No. 112s, or Old English Pattern 114s.

Table Spoons or Forks, 34/- gross. Dessert Spoons or Forks, 21/6 Gross. Large Tea Spoons, 15/- gross.

No. 114, Strong Old English.

NICKEL PLATED BELLS.

No. 81. Nickel Plated, Press-down, 3½ in., 7/6 doz.

No. 81½. Nickel Plated, Bronze Stand, 8/- doz.

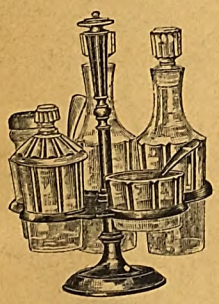
No. 82. Nickel Plated, Electric, 3½ in., 12/-; 3 in., 9/8 doz. on Marble Slab, 13/- doz.

No. 83. Nickel Plated all over, 7/6 doz.

No. 84. Nickel Plated, Wood Handle, 4/6 doz. Small, 4/- doz.

No. 85. Nickel Plated, Bronze Stand, 4/- doz.

No. 86. Door Bell, Nickel Plated, 8/6 doz. Blued do., 4/3 doz.



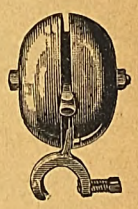
122. Nickel Plated Cruet, 5 Glass, Mustard and Salt Spoons, 3/3 each.

121. Nickel Plated Dinner Cruet, 4 Glass, with Spoons 2/11 each.

120. Nickel Plated Breakfast Cruet, 3 Glass, with Salt and Mustard Spoons, 2/1 each.

125. Nickel Plated Bicycle Bell,

2¾	3¼ inch.
7/6	10/- doz.



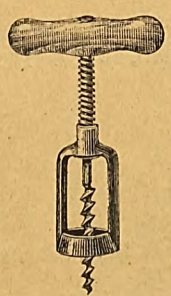
126. Nickel Plated Double Bicycle Bell, 21/- doz.

Pocket Corkscrew,

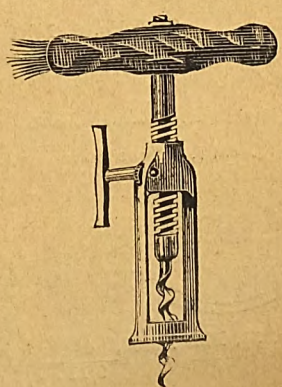
	Com.	Med.	Best.
No. 98,	1/5	2/6	4/8 doz.

Common Special, 8/- gross.

No. 103, Nickel Plated, 8/6 gross.



No. 100, Nickel Plated, 4/10 dz. If Bronzed, 4/8 doz.



No. 100 R, Nickel Plated, Jack Corkscrew, 16/- doz.

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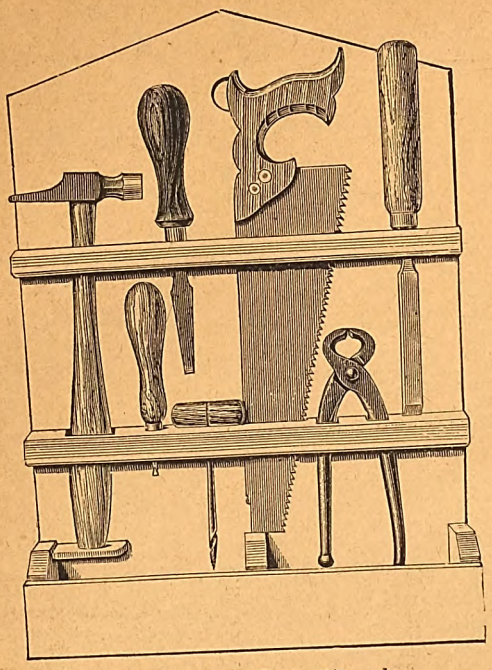
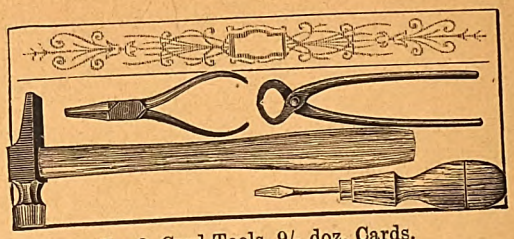
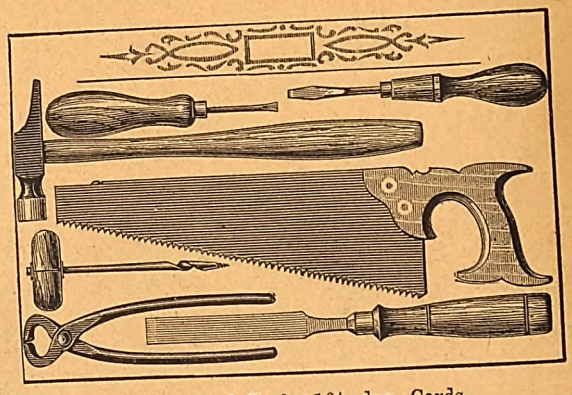
ATKINSON BROTHERS, Export & Import Merchants, 1, Graham St., Birmingham.



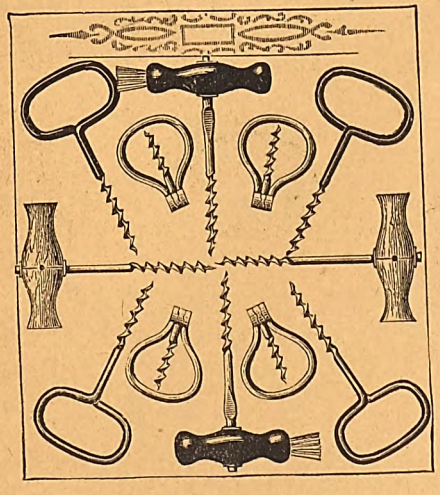
No. 1, Wood Rack Tools, 2/9 each.



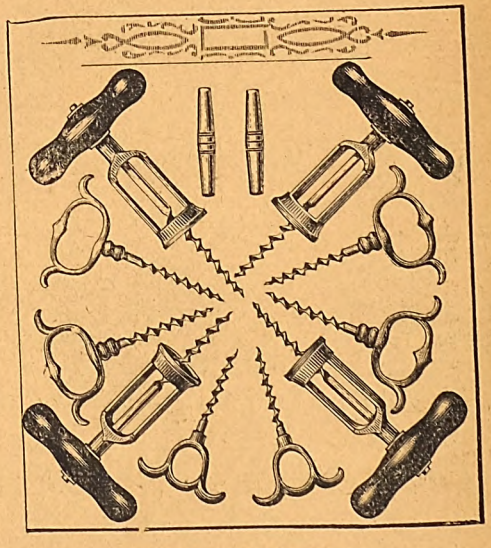
No. 2, Card Tools, 9/- doz. Cards.



No. 3, Card Tools, 16/- doz. Cards.



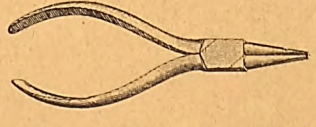
Card No. 5, 1/6 Card.



Card No. 6, 3/4 Card.

No. 97, Japanese Fishing Rod, Four-draw, 2/- doz. If Three-draw, 1/6 doz.

No. 5½, Flat Nosed, 4½ 5 inch. 2/11 3/3 doz.



No. 6½, Round Nosed, 4½ 5 inch. 2/11 3/3 doz.

No. 29, 7½ inch., 3/8 doz.

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ATKINSON BROTHERS, Export & Import Merchants, 1, Graham St., Birmingham.

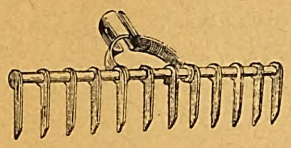
Children's Garden Tools, 8/8 per dozen Sets, consisting of

No. 130, Blued Rakes only, Polished Handle, 3/4 doz.

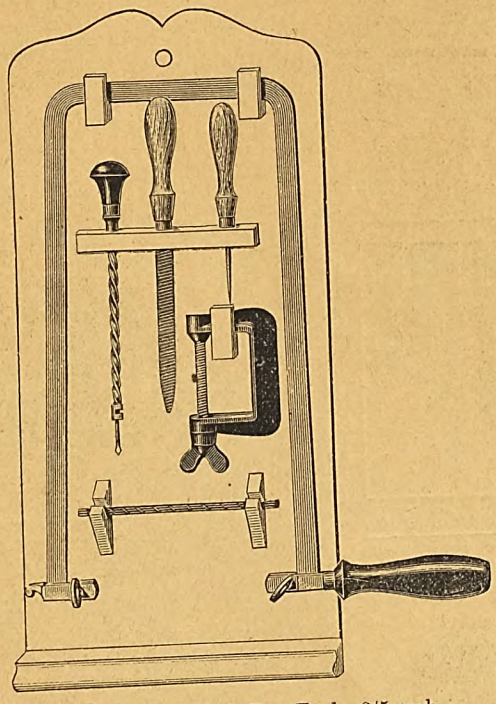
No. 132, Blued Spade, Polished Handle, 3/2 doz.

Do. larger, with T Handle, Nos. 2 3.
4/- 4/3 doz.

No. 131,
Blued Trowels, Polished Handle,
2/2 doz.



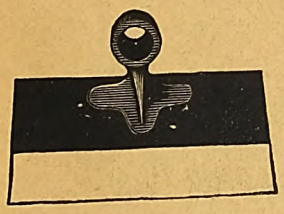
No. 57, Garden Rake,
12 Teeth, 4/4 doz.



No. 4, Wood Rack Fret Tools, 2/5 each.
172 Fret Tools, as above, on Cards, 14/6 doz.
173 ,, ,, without Cramp, 9/6 doz,
174 ,, ,, without Drill, 7/9 doz.

No. 66, Masons' Trowel,

Solid,	7in.	8½in.	10in.
	5/-	9/-	9/8 doz.
Rivetted,	3/6	4/-	4/6 ,,

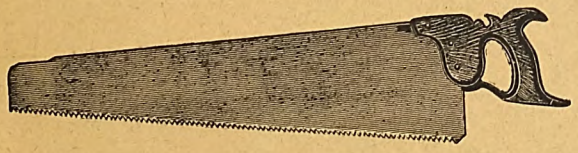


No. 136, Hoe, 6in. 7in.
4/- 4/8 doz.

No. 61, Nutcrackers.
Bright, 4/8 doz. Nickel Plated, 8/- doz.

No. 37, Bicycle Wrench,
Bright, 4/9 doz.
Nickel Plated, 7/6 doz.

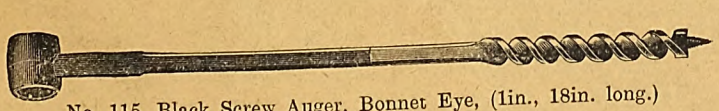
No. 104, Tinned Table
Spoons, 4/6 gross.
Do., Tea ,, 2/10 ,,



No. 41, Hand Saw, 20in. 26in.
9/6 12/- doz.

No. 43, Hand Saw, Common, 20in. 24in.
4/7 7/11 doz.

Back Saws to match, 14in., 3/11.

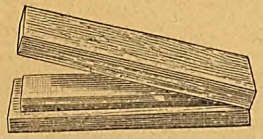


No. 115, Black Screw Auger, Bonnet Eye, (1in., 18in. long.)

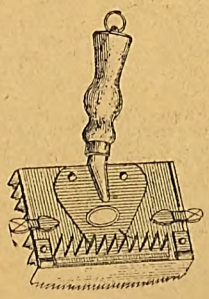
$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$ inch.
2/9	3/1	3/7	4/7	5/6	5/10	6/7	7/6	8/6	9/- doz.

No. 61, Curling Tongs, 2/- doz.
No. 61, N.P., Nickel, 2/6 doz.

No. 62, Oil Stone, on Card,
4/9 doz.



No. 63, Oil Stone, in Box,
8/10 doz.



No. 27, Curry Mane Comb,
Tinned 4/3 doz.
Jappanned 3/9 ,,

No. 46, Eyelet Plyers, 7/8 doz.

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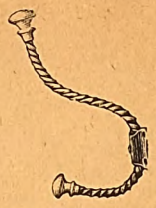
ATKINSON BROTHERS, Export & Import Merchants, 1, Graham St., Birmingham.

No. 67,
Japd. Wire,
4/10 gross.

No. 68,
Japanned
6/- gross,
Nickel Plated,
1/4 doz.

No. 171,
Japanned,
9/8 gross,
Nickel Plated,
21/- gross.



No. 69, Japd.,
China Knobs,
12/4 gross.
No. 69½, If
Rivetted Knobs,
16/- gross.

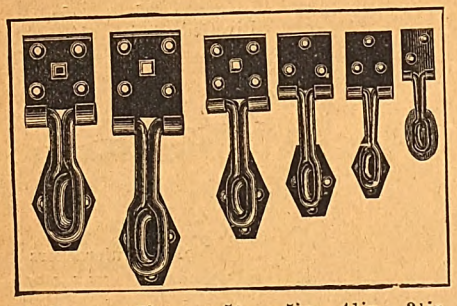
No. 70½,
Nickel Plated,
White Knobs,
Rivetted,
2/3 doz.

No. 71.
Polished Brass,
Rivetted Knob,
4/9 doz.

No. 72,
Large Nickel,
Vit. Knobs,
8/5 doz.

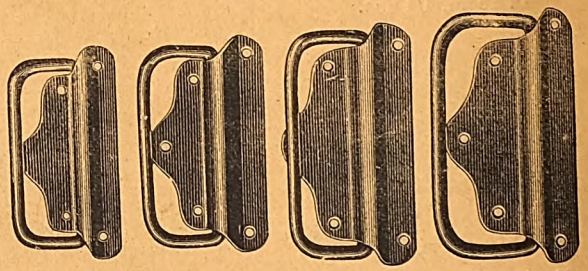
No. 156, Hasps and Staples,

6in.	7in.	5½in.	5in.	4½in.	3½in.

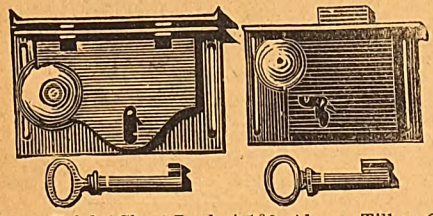


Full Length	6in.	7in.	5½	5in.	4½in.	3½in.
					Self color 5	Self color 6
	Jap. 2	Jap. 1	Jap. 3	Jap. 4	8d.	5½d. doz.
	1/10	2/2	1/6½	1/2		

No. 138, Japanned Trunk Handles.

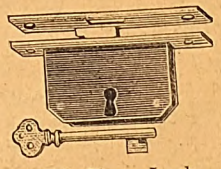


3in.	3½in.	4in.	4½in.
1/6	1/11	2/6	2/11 doz. pairs.

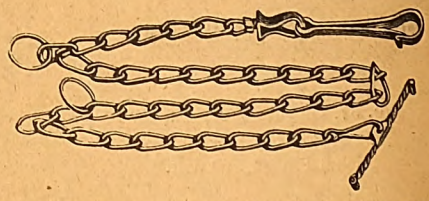


167, Alarm, Bright Chest Lock, with Bell, 8/- doz.

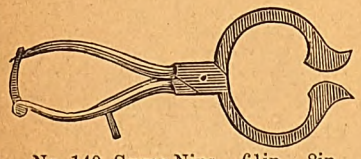
168, Alarm, Till or Cupboard Lock, 4/10 doz.



172, Piano Lock,
Brass Plate, 2/10 doz.

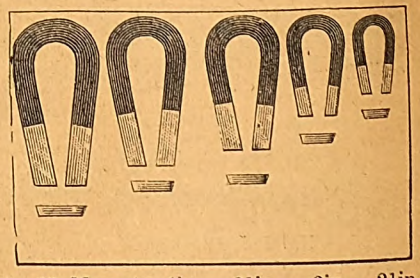


No. 99, Tethering Chains, 4½ feet long, 5/4 dozen.

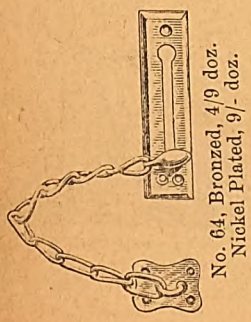


No. 140, Sugar Nips, 6½in. 8in.
8/- 10/6

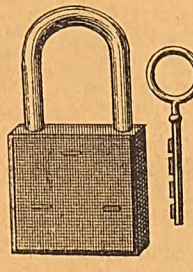
No. 26, Grass Shears, Straight or Bent,
9in. 10in. whole length.
5/- 5/3 doz.
Glazed Shanks, 10in. 6/3, 12in. 8/- doz.



No. 10, Magnets, 4in. 3½in. 3in. 2½in.
2/9 1/8 1/3 7½d. doz.



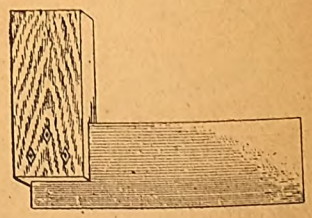
No. 64, Bronzed, 4/9 doz.
Nickel Plated, 9/- doz.



No. 43, Jap. Padlocks,

1¼	1½	2 inches.
8/8	9/6	21/6 gross.

No. 44, Jap. Padlock, 1/11 doz.
2 inches.



No 28, Plated, 6in. 4/7 doz. 10in. 5/9 doz.

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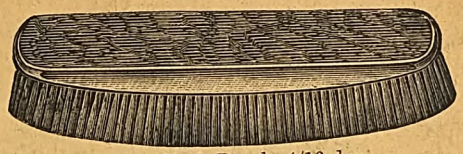
ATKINSON BROTHERS, Export & Import Merchants, 1, Graham St., Birmingham.

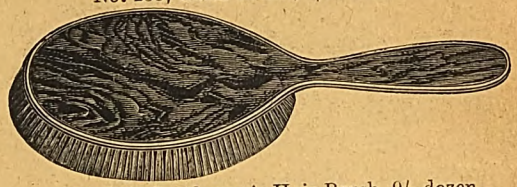
SPECIAL LINES IN BRUSHES.

No. 230, General Hair Brush, 4/6 dozen.



No. 233, Cloth Brush, 4/10 doz.

No. 231, Ladies' Hair Brush, 8/10 dozen.

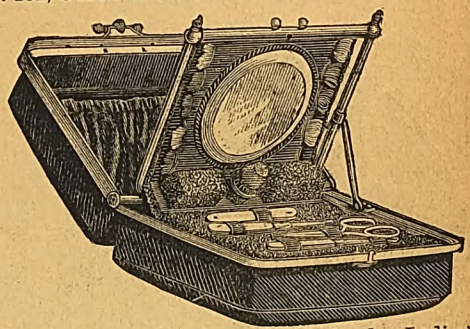


No. 232, Gentleman's Hair Brush, 9/- dozen.

No. 234, Leather Bag, Nickel Frame and Handle.

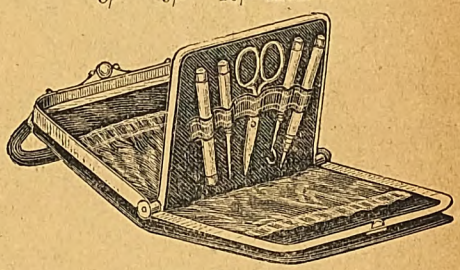
5½	6½	7½ inches.
2/-	2/5	2/10 each.

No. 235, Best Russian, Nickel Frame, leather-lined, 8 inches, 12/- each.



No. 236, Persian Bag, satin lined, fitted as Ladies' Companion.

5½	6½	7½ inches.
8/-	9/-	10/- each.



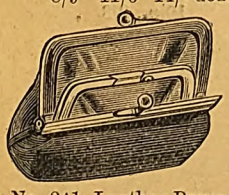
No. 239, Ladies' Companion, Russian, Satin Lined.

6½	7½	8 inches.
16/-	18/-	20/- each.

No. 240, Calf Purse,

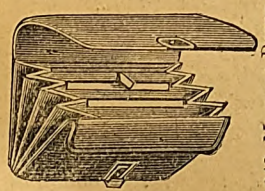
No. 1	2	3
8/9	11/6	14/- doz.

No. 237, Plush Case, Glass Front, contains 1 dozen Ivory & Pearl Knives, 12/- each; if smaller Knives, 9/- each.



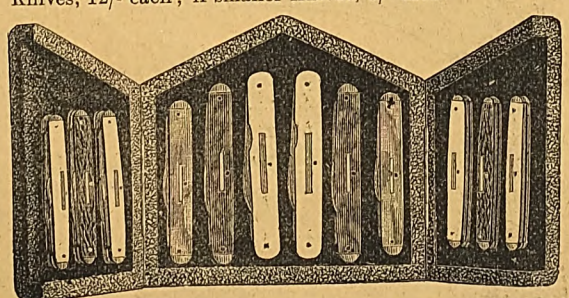
No. 241, Leather Purse,

No. 1	2	3	4
4/10	5/10	7/10	9/-doz.



242, Morocco Purse,

No. 2	3	4
18/-	20/-	22/- doz



238, Plush Case, contains 1 doz. Ivory, Pearl and Stag 2 and 3 bladed Knives, 12/- each; Do., smaller Knives, 8/8 each

No. 243, Morocco Ladies' Companion, fitted.

6½	7½	8 inches.
16/-	18/-	20/- each.

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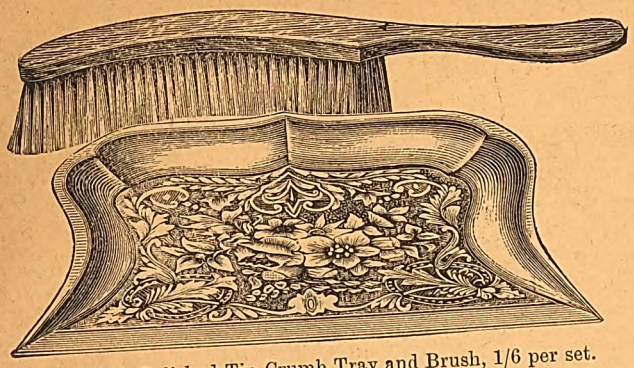


No. 190, Polished Tin Crumb Tray and Brush, 1/6 per set.
No. 190 E.P., Electro Plated ,, ,, 2/4 ,,

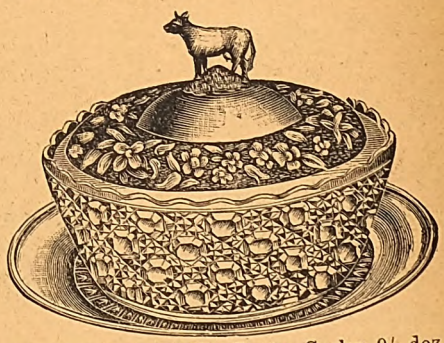
No. 196, Oval Polished Tin Waiter. Numerous designs in oval and round.

	8	10	12	14	16	18	20in.
	5d.	8d.	10d.	1/4	2/-	3/4	4/8 each.
Electro Plated,	1/1	1/6	1/10	2/11	4/-	6/8	9/6 ,,

No. 192, Polished Tin Waiter, 12in., 5/10 doz.
No. 192 E.P., Electro Plated ,, ,, 14/- ,,

No. 193, Glass Tray, 3in., 8/- gross.
No. 193 E.P., Electro Plated, 16/- gross.

No. 169, Breakfast Cruet, N. P. Pepper, Blue or White Glasses, 14/- doz.
With Spoons, 14/9 doz.
4-glass ditto, 19/- doz.
4-glass do., with Spoons, 19/9 doz.

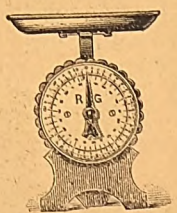


No. 194, Polished Tin Butter Cooler, 9/- doz.
No. 194 E.P., Electro Plated ,, 11/- ,,

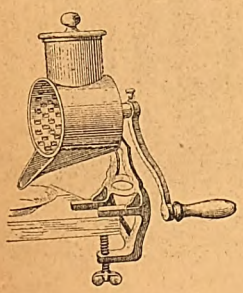
No. 195, Polished Tin Card Basket, 10in., 2/- each.
No. 195 E.P., Electro Plated ,, 10in., 2/8 ,

No. 197, Polished Tin Teapot, 6 gills, with new sliding strainer, 10/8 doz.

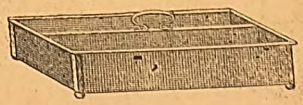
The Lightning Egg Cutter, Nickel Plated, 12/- doz.



No. 175, Family Balance, $\frac{1}{16}$ to 20 lbs., in Kilo or English Weight, White Dial, 3/5 each.



Mill.
No. 58, 22/6 doz.



No. 60, Wire Knife Basket, 4/8 doz.

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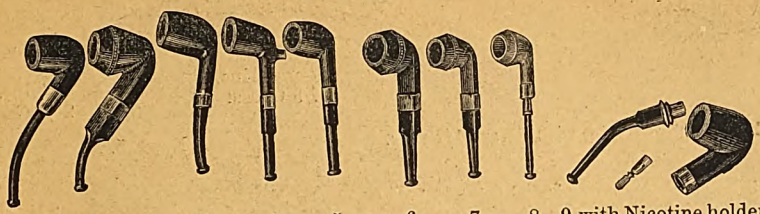
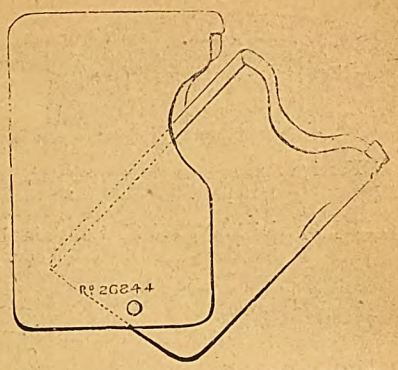
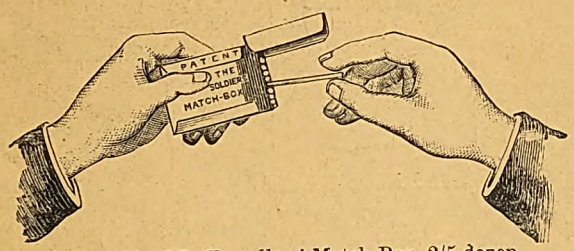
BRIAR PIPES.



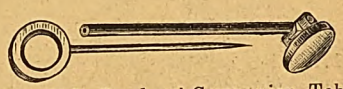
Nos.	1	2	3	4	5	6	7	8	9 with Nicotine holder
	4/6	5/-	4/6	4/6	4/3	5/-	3/6	2/3	9/6 dozen.



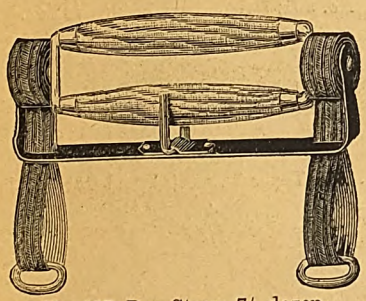
No. 401, N.P. Pocket Vesta Box, 3/11 doz.



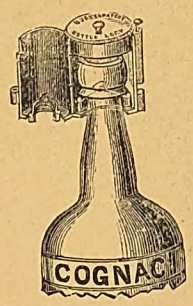
No. 400, N.P. Travellers' Match Box, 2/5 dozen.



No. 402, N.P. Smokers' Companion, Tobacco Stopper, Pipe Cleaner, Cigar Pricker and Holder combined, 1/11 dozen.

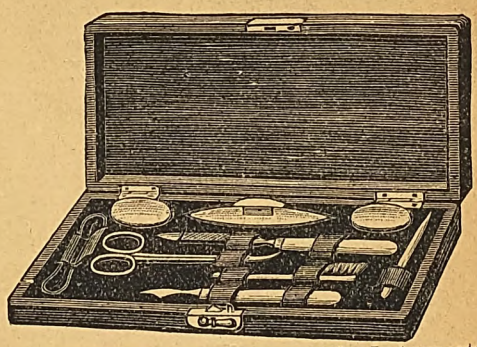


No. 307, Rug Strap, 7/- dozen.
No. 308, ,, 4/8 dozen.



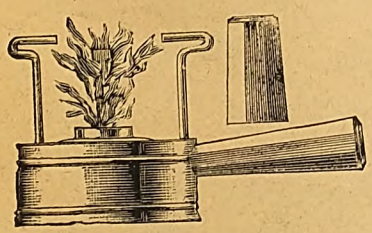
No. 403, Patent Bottle Locks, for locking over neck of bottle, Nickel Plated, made to fit any bottle.

Size Ordinary Wine Bottle, 2/11 each.

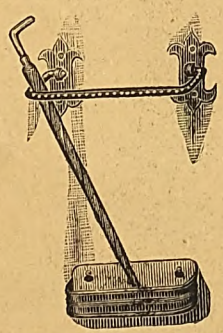


No. 410, Roan Manicure Case, contains Instruments for the preservation of the finger nails. In Bone Handles, 20/- each; In Ivory Handles, 27/- each.

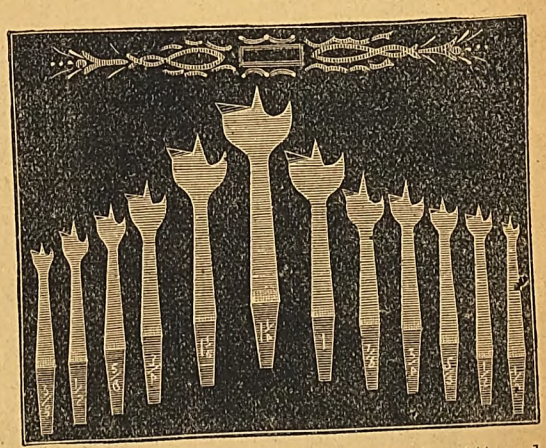
No. 74, Salt and Spoon, 4/8 dozen.



No. 404, Rechaud Spirit Stove, small, 4/4; large, 4/10 dozen.
No. 405, do., large, Brass Regulator and Cap, 10/6 dozen.
No. 406, do., Travellers' Combination Cooking Stove, 26/8 dozen.



No. 407, Brass Umbrella Stand, with Japanned Pan,
Complete .. 2/8 each.



408, Black Centre Bits, ¼ to 1¼, card of 1 doz. 1/4 card.
409, Black Centre and Shell Bits, card of 1 doz. assorted, 1/4 card.

No. 411, Special 4-feet Cane & Thread Whip, with Lash, 10/- per dozen, if 3-feet—9/- per dozen.

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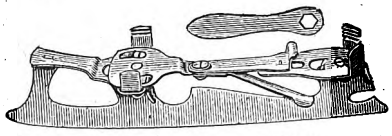
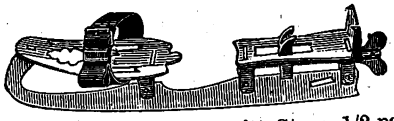


No. 133, Foreign made Acme Pattern Skates, 1/10 pair.



No. 134, Skeleton Skate, with Strap. 1/2 pair.

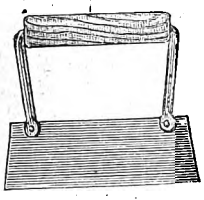
SPECIAL BRASS POLISH.

In Penny Tins, 7/9 Gross.

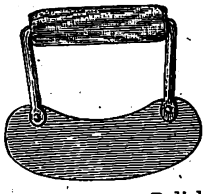
In Threepenny Tins, 20/- Gross.

No. 135.

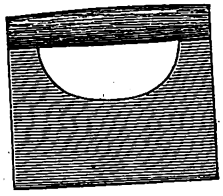
No. 134½, Special line Wood Skates, stained (either 3 holes for straps or broad toes), 6/6 doz. pair.



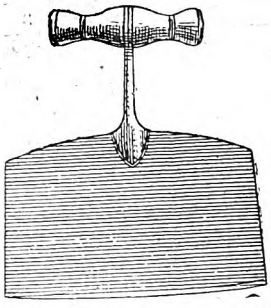
No. 176, Mincer, Polished Handle, 6in., 2/6 doz.



No. 177, Mincer, Polished Handle, 6in., 2/11 doz.

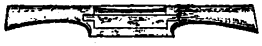


No. 8, Mincer, Polished Handle, 6in., 3/9 doz.



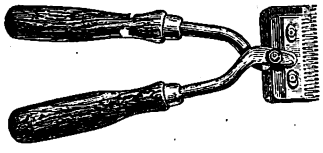
No. 7, Mincer, Polished Handle, 7in., 4/8 doz.

No. 7½, Plain Handles, 6in., 3/10 doz.



No. 38, Spokeshave, Plated,

3	3½in.
5/4	7/- doz.



No. 303, Horse Clipper, Polished Handle, 2/6 each.

No. 301, Spirit Level, 8in., 4/9 doz.

No. 302, Taper Saw Files, 2nd Cut, Single.

4	4½	5in.
1/3	1/5	1/7 doz.

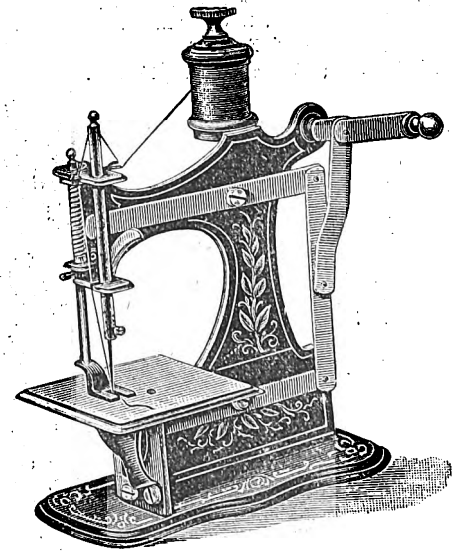
No. 300, Handled Chisels, 2/6 doz.
1 doz. on card, assorted. ½ to 1in.

No. 304, Drill Brace, Best, on single cards, with 6 Bits.

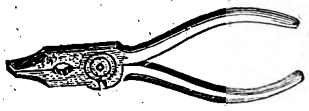
6½	8	10	12in.
8/8	13/4	15/4	19/- doz.

No. 305, Card of ½ doz. 7in., 2nd quality, 2/4 card.

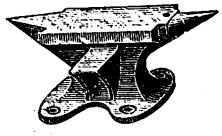
No. 306, Card of ½ doz. 6in., 2nd quality, 1/8 card.



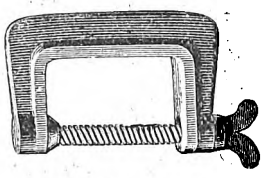
No. 165, Useful Sewing Machine, 3/6 each.



No. 305, Combination Gas and Wire Cutting Pliers, 5½in., 8/8 doz.

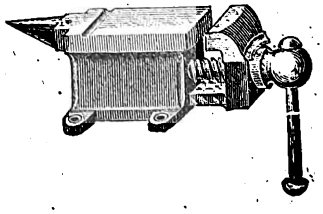


No. 310, Double Bick Anvil, 1 lb., 8/8 doz.



No. 312, Cramp.

2¼	3	4in.
2/6	3/2	3/8 doz.



No. 311, Anvil and Vice.

2¼	3½ lbs.
2/6	3/- each.

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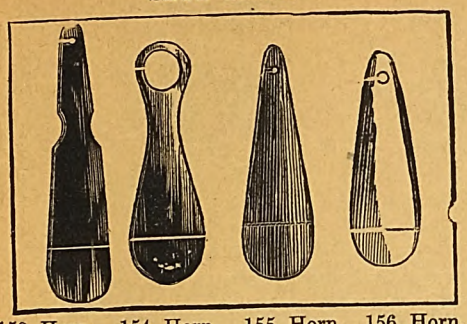
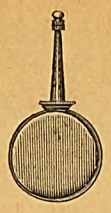
SHOE LIFTS.

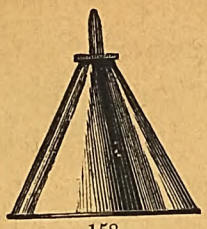


153, Horn. 3/9 doz. 154, Horn. 3/6 doz. 155, Horn. 2/8 doz. 156, Horn. 1/10 doz. If Tinned, 157, 9/9 gross.



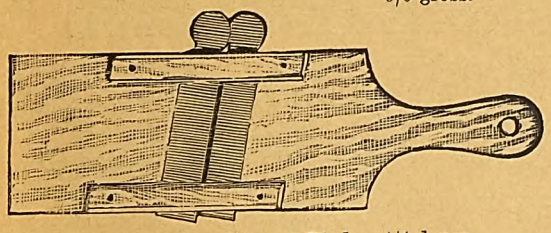
123. Pocket Oiler, Brass 2/6 doz. Tin 1/11 doz

124. Tin, 0 1 9d. 1/4 doz. Brass. 4 5 1/3 1/7 doz.

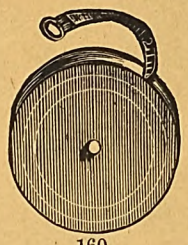


158. Carpenter's Oiler, 2/8 dozen.

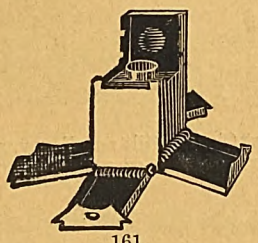
No. 162, Egg Beater, 4/8 doz.



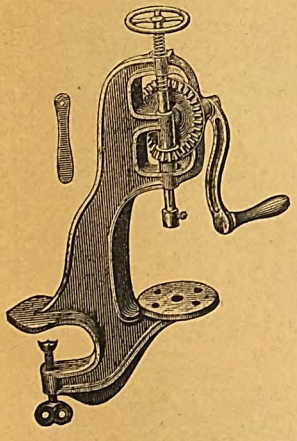
159, Cucumber Slicer, 2 Blades, 4/4 dozen. If 1 Blade, 4/2 dozen.



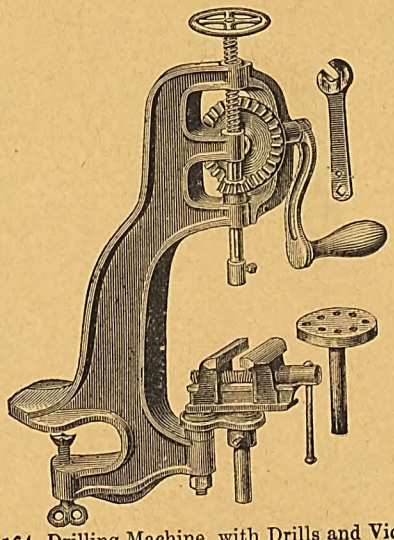
160. N.P. Measuring Tapes, 3 ft. 3/10, 5 ft. 5/- doz. Special line, 2ft. 8/9 gross



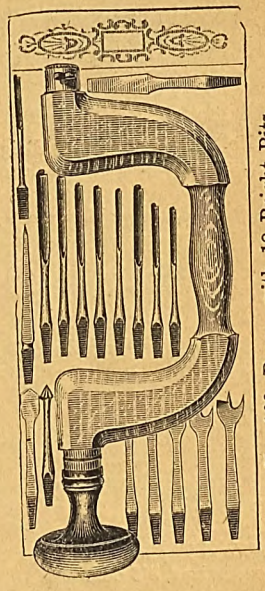
161. N.P. Folding Pocket Ink Stand. 5/3 doz.



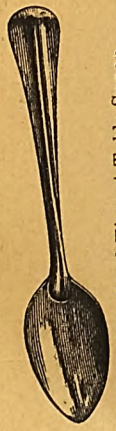
163, Drilling Machine, 7/- each.



164, Drilling Machine, with Drills and Vice, 14/8 each.



No. 166, Brace, with 18 Bright Bits, on Card, 3/7 each.



No. 128, Steel Tinned Table Spoon, 6/3 per gross. Tea Spoons, 4/8 per gross.

No. 140, Steel Tinned Table Spoons, strong, 13/- gross.

No. 39, Machine Turnscrew, Assorted. 7/- Gross. Bradawls, 7/- Gross, with same Handle.

No. 40, Turnscrew, Assorted, on Cards, of 1 doz., 6 to 9 in., 2/11 Card.

No. 55, Small, 20/- Gross. No. 54, Larger, 22/4 Gross. No. 55½, Special, 8/9 Gross.

No. 75, Hard Metal Shaving Dish and Brush. 8/10 doz. Sets.

Brushes only, 4/6 dozen. Better Brushes, Badger Hair, 9/- dozen.

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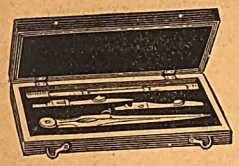
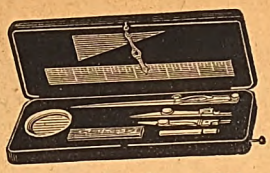


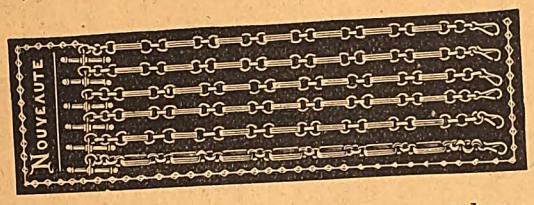
No. 87, Box Compasses,
14/- dozen.



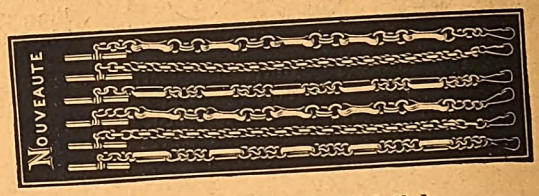
No. 88, Box Compasses,
2/11 each.
{Special Box for Schools,
No. 87½, 4/3 doz. boxes.}

No. 89, Box Compass,
23/- dozen boxes.

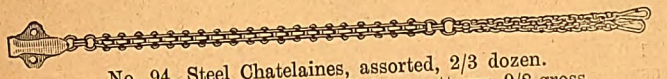
No. 93, Assorted Key Rings
1/10 gross,
on Cards of 1 doz.
No. 93½, cheaper assortment
8d. gross, on Cards.



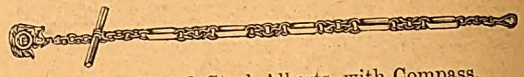
No. 90, Albert Chains, Gilt and Fancy, assorted on
Cards of half-dozen, 61/- gross.



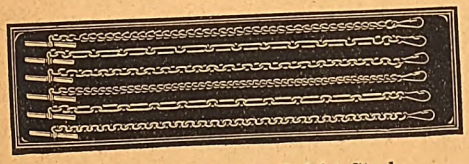
No. 92, Steel Alberts, Nickelled,
Assorted on Cards of half dozen, 17/- gross.



No. 94, Steel Chatelaines, assorted, 2/3 dozen.
No. 94a, ,, ,, lighter patterns, 9/8 gross.
No. 94b, ,, ,, special line, 5/3 gross.



No. 95, Nickel Plated Steel Alberts, with Compass,
4/6 dozen.



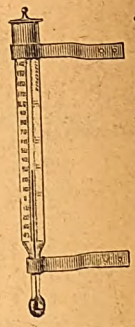
No. 91, Albert Chains, Bright Steel,
Assorted, on Cards of half-dozen, 6/3 gross.

No. 76, Blk. Wood, 6½in., 2/3 doz.
8in., 3/4 doz.

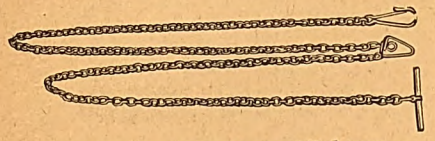
No. 77, with Barometer, 5/4 doz.
larger size, 8/6 doz.

No. 78, Boxwood, 8in., 8/4 doz.

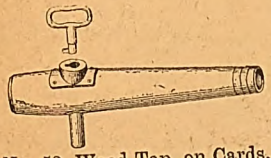
No. 79, China Face, 10/- doz.



No. 80, Nickel Plated Mounts, for
testing Hot Water, or for
fixing outside, 12/- doz.



No. 96, Steel Dog Chain, 3/2 dozen.
No. 96½, ,, ,, lighter, 2/6 dozen.



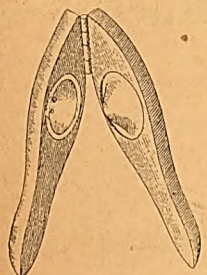
No. 53, Wood Tap, on Cards,
assorted sizes, 3/3 doz.

No. 50, Tin Opener,
8/9 gross.

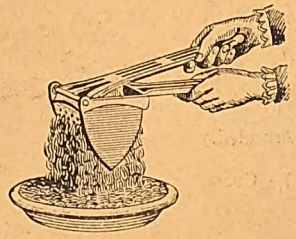
No. 51.
Scissor Tin Opener,
8/5 dozen.
No. 51½.
2nd quality, 4/10 doz.

No. 137, Paper Clip,
2/10 gross.

No. 65.
Split Key Ring,
Bone Tablet,
assorted sizes,
2/6 gross, in boxes.



Lemon Squeezer,
No. 56, 4/7 doz.



No. 73,
Potato Masher or Fruit Press,
9/- dozen.
Large, 12/. dozen.

No. 127,

Black Stamped Coal Shovel, Socket Handle.

No. 1, 4½in. wide.	No. 2, 5in. wide.	No. 3, 5½in. wide.	No. 4, 6in. wide
Length of Shovel, 7½in.	8¾in.	10in.	11in.
Full length, 17in.	18in.	18in.	20in.
2/10	3/6	4/2	4/10 doz.

An Assortment of Plush and Leather Purses and Ladies' Bags, from 2/9 to 9/6 doz.

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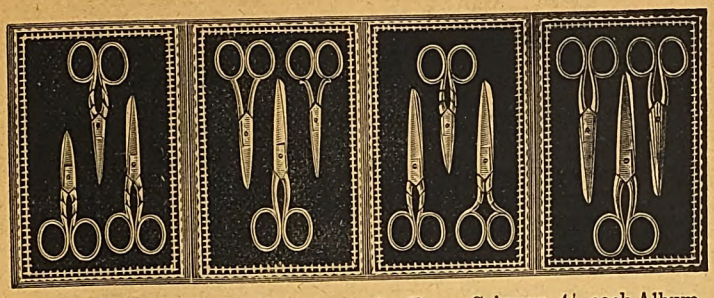
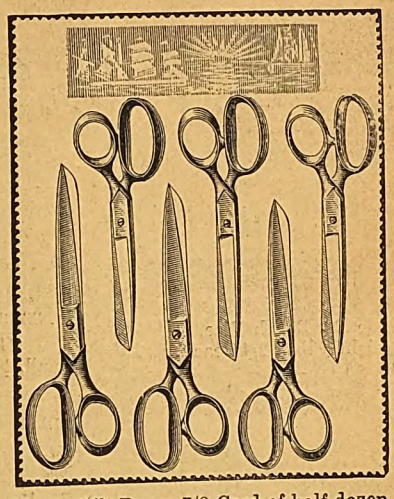
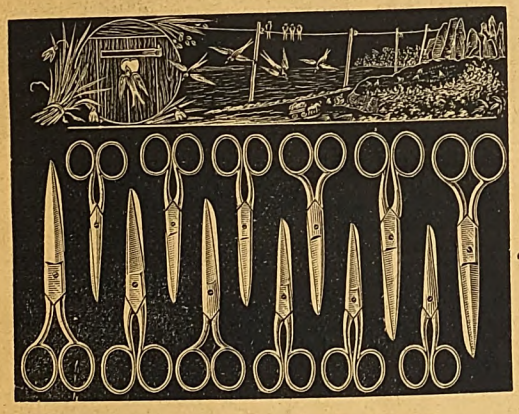
ATKINSON BROTHERS, Export & Import Merchants, 1, Graham St., Birmingham.



No. 14, Folding Album, containing 12 pairs Fancy Scissors, 4/- each Album.
No. 14½ „ „ „ 12 „ „ „ larger and better assortment, 7/3 each Album of one dozen.



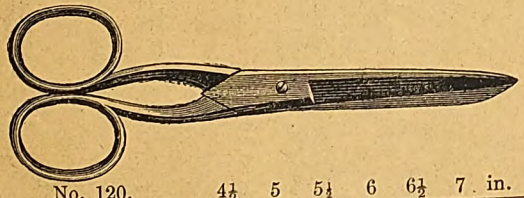
No. 8, Gilt Bows, 7/8 Card of half dozen.
No. 9, Nickel Plated, Commoner, 3/4 Card of half dozen.



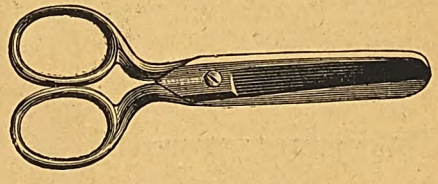
No. 7, Nickel Plated, 3/6 Card of 1 dozen.
If commoner, 2/6 Card of 1 dozen.

No. 13,
Case, with 4 pairs Scissors, 2/5 each.
„ 3 „ 2/1 „
„ 2 „ 1/6 „

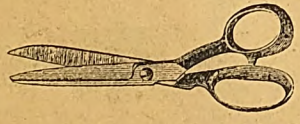
No. 116, Embroidery Scissors, Polished..... 6/- doz.
No. 117, „ not Polished .. 3/6 „



No. 120, Cutting-out Scissors,	4½	5	5½	6	6½	7 in.
	2/7	3/4	4/2	4/7	5/6	6/6 doz.

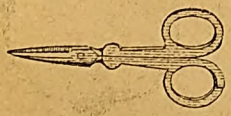


No. 119, Drapers' Scissors, 4½ in., 4/8 dozen.
No. 119½, „ commoner, 4½ „ 3/6 „

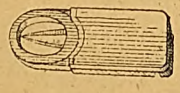


No. 11, Bronzed Bows.....	5½	6½ in.
	4/6	7/- doz.
Nickel Plated Bows		9/- „

No. 152, Barbers' Scissors, 7 in., 13/- dozen.



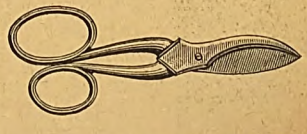
OPEN.



CLOSED.

No. 12, Folding Pocket Scissors, in Case, 4/- dozen.
No. 12½, „ „ „ N.P. Bows, best, 9/- doz.

No. 150, Card Embroidery Scissors, 4/4 per Card of ½ doz.



No. 151, Pruning Scissors, N.P. Bows, 10/6 dozen.

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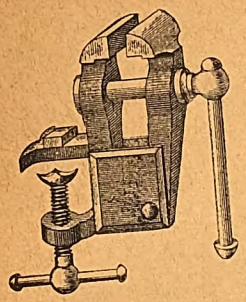
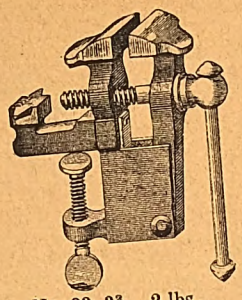
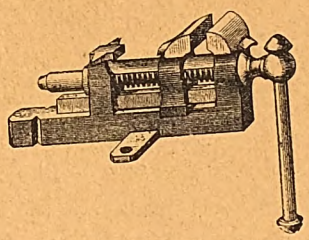
ATKINSON BROTHERS, Export & Import Merchants, 1, Graham St., Birmingham.



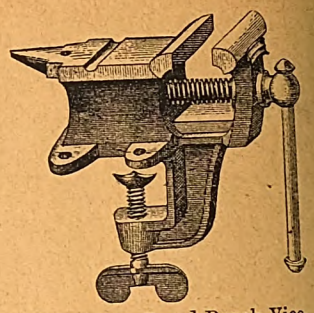
No. 32, Bench Vice,
Weight 4 lbs., 2/11 each.



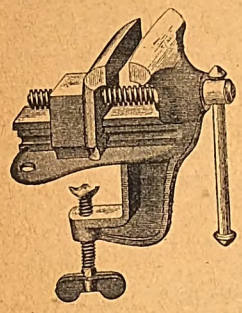
No. 33, $3\frac{3}{4}$ 2 lbs.
24/8 14/8 doz.
Small, $\frac{1}{2}$ lb., 4/- doz.



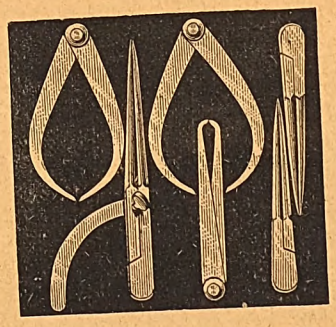
No. 34, Parallel Vice—$2\frac{3}{4}$ 4 lbs.
4/8 6/9 ea.



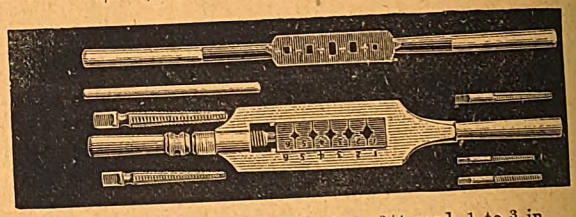
No. 35, Anvil and Bench Vice,
2 lb ., 2/5 each.



No. 36.. 2 3 4 lbs.
1/6 2/5 2/11 each.



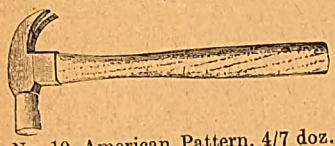
No. 22, Card Compasses and
Callipers, 2/11 per Card.



No. 15, Stocks and Dies, complete, 6/4 card, $\frac{1}{8}$ to $\frac{3}{8}$ in.
No. 15A, ,, ,, in Box, $\frac{1}{8}$ to $\frac{1}{2}$ in., 11/- each.

No. 59, Nail Puller, 12 16 20 in.
1/7 2/7 3/6 each.

No. 18, 3/8 dozen.



No. 19, American Pattern, 4/7 doz.

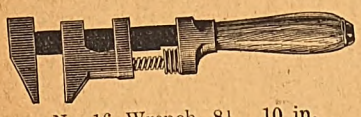
No. 20, Blued Hatchet, 6/8 doz.

No. 21, Hatchet, 4/9 dozen.

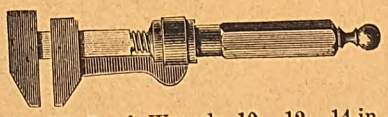
No. 23, 10 Holes with Dies, 3/1 set.

No. 24, 3/4 dozen.

No. 25, 6 Holes, on Card, with Dies, 3/4 set.

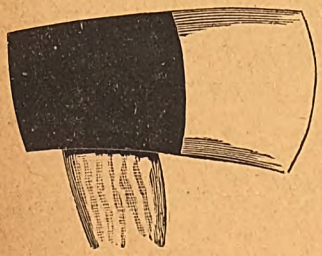


No. 16, Wrench, $8\frac{1}{2}$ 10 in.
9/- 12/- doz.
No. $16\frac{1}{2}$, lighter, 8 in.—4/8 dozen.

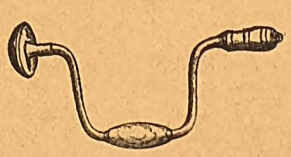


No. 17, Coach Wrench, 10 12 14 in.
3/4 4/- 5/- each.

$17\frac{1}{2}$, Double Coach Wrench, $8\frac{1}{2}$ 10 12 in.
2/8 3/9 4/8 ea.



American Axes, assorted,
$3\frac{1}{2}$ to 5 lbs., 40/- doz.
With long Hickory Handles,
60/- dozen.



No. 31, American Brace, 1/10 each.
No. 31B, Nickel Plated, do., with Ratch,
5/3 each.

No. 30, Ball Brace, 4/8 dozen.
If on Card, with 6 Bits,
10/- dozen Cards.

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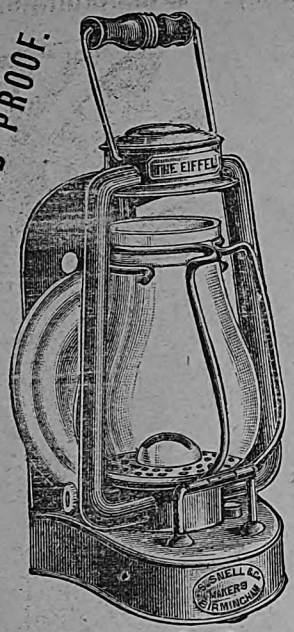
THE PATENT EIFFEL HURRICANE.

ABSOLUTELY WIND PROOF.

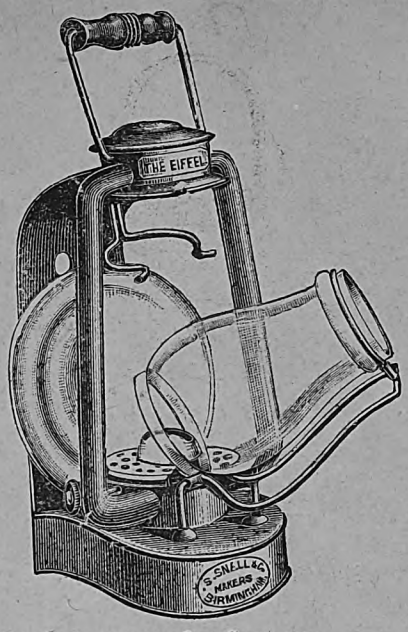


Back Lamp or for Cart use.

STAMPED FOUNTS.

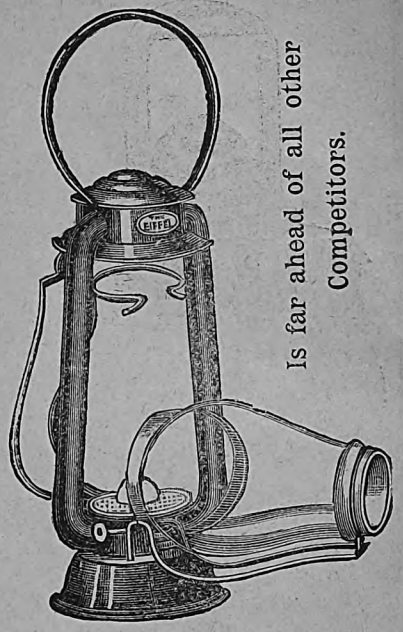
¾ In. BURNERS.

JAPAN'D RED.



Back Lamp or for Cart use.

EASY TO LIGHT AND TRIM.



Is far ahead of all other Competitors.

SAMUEL SNELL & CO.

(Late SNELL & BROWN),

MANUFACTURERS OF CYCLE SUNDRIES, &c.,

☞ CYCLE LAMPS,

SHIP LAMPS, RAILWAY LAMPS,

CARRIAGE LAMPS,

STREET LAMPS,

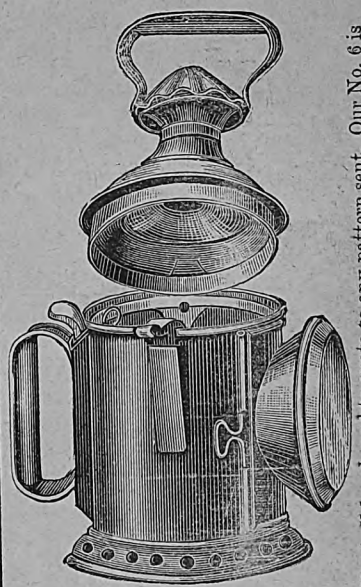
HURRICANE LANTERNS,

&c., &c.

Works:
59 & 60,
SKINNER LANE,
BIRMINGHAM.

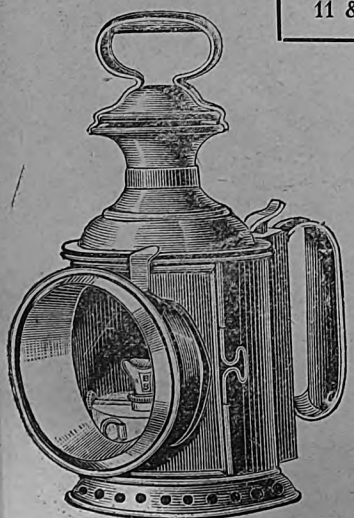
London Warehouse:
11 & 19, GREAT EASTERN STREET, E.C.

No. 20.—Small Size Tricolor Guards Lamp.

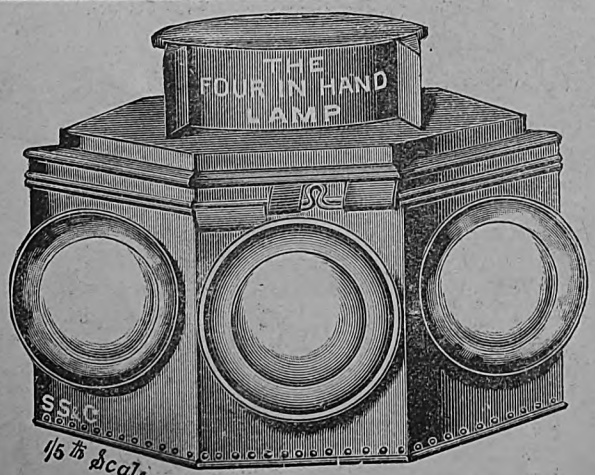


No. 7B.—Tricolor Guards Lamps

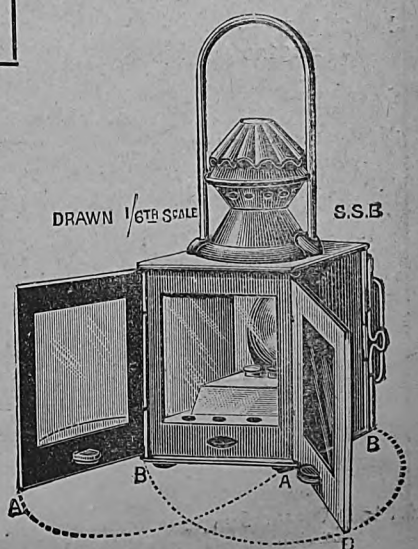
We shall be pleased to quote to any pattern sent. Our No. 6 is the pattern usually used by the Principal Railway Companies.



No. 6. Tricolor Guards.



Lamps for Coaches or Buses,
Fitted with extra wide iron to fix a footboard in front of the drivers. A useful lamp for all large conveyances.



No. 19.—Square Tricolor Guards' Lamp.

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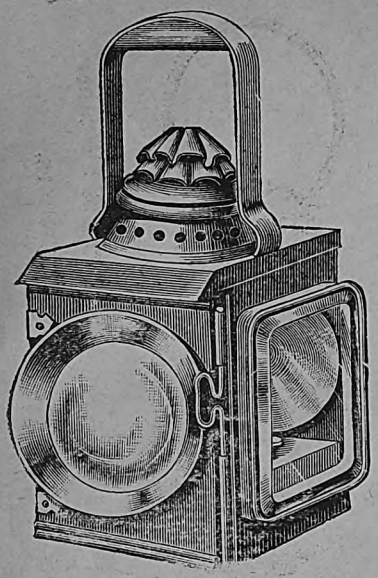
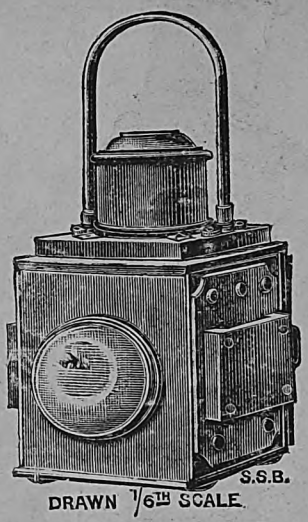
SAMUEL SNELL & CO., LAMP MANUFACTURERS, BIRMINGHAM.



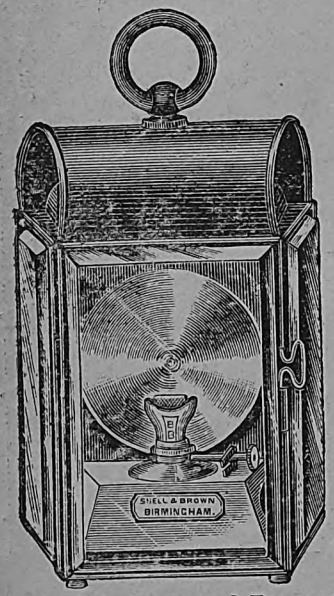
No. 131. Plough Lamp or Engine Lamp.



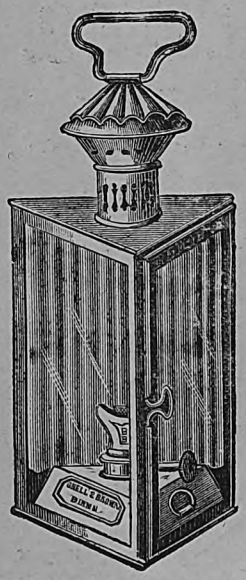
No. 132.—Engine Head or Tail Lamp.

No. 29. Candle Lanterns. Will nest for Export.

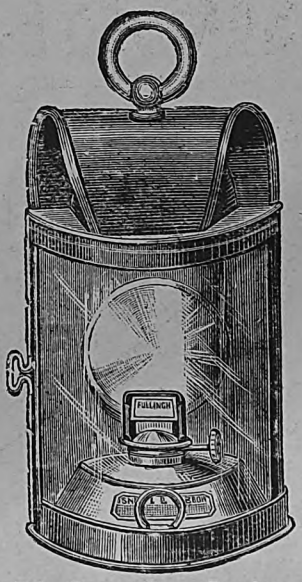
ENGINE AND GUAGE LAMPS.



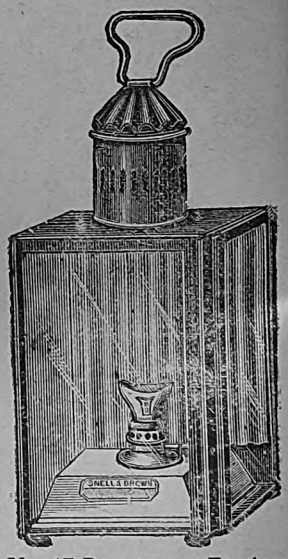
No. 134. Improved Tapered Side Engine Room Lamp.



No. 16. Passage or Engine Room Lamp.

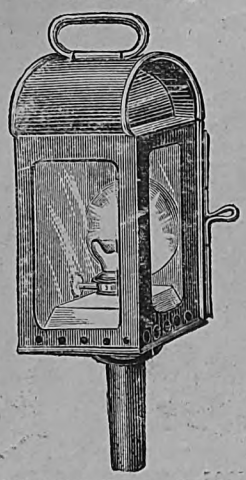


No. 126. Round Face Engine Room Lamp.

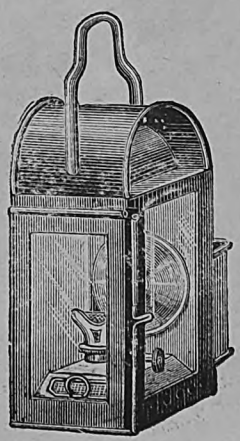


No. 17. Passage or Engine Room Lamp.

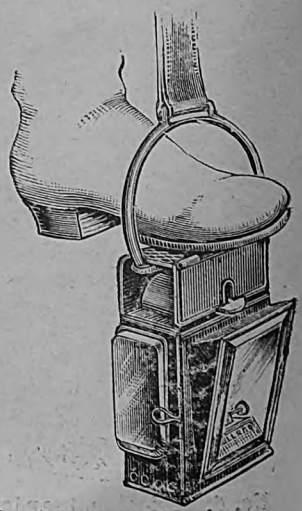
No. 162. Water Guage Lamp.



No. 163. Guage Lamp



No. 141. Water Guage Lamp.



No. 10.—Stirrup Lamp. Improved Pattern.

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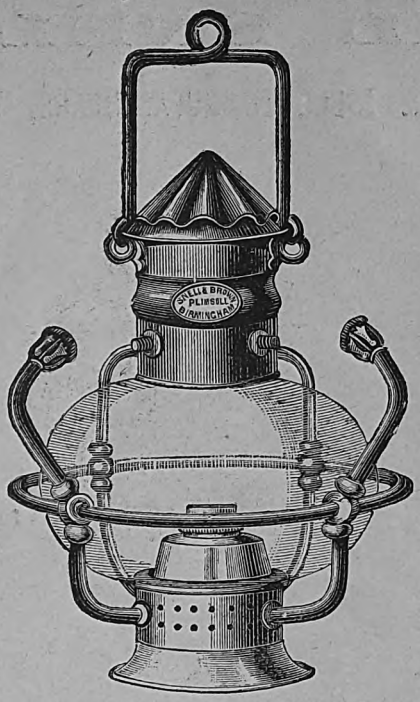
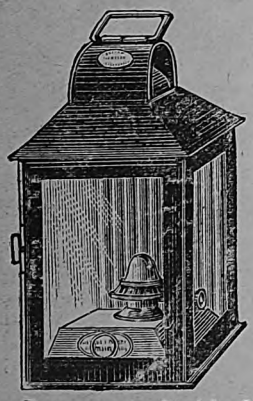
SAMUEL SNELL & CO., LAMP MANUFACTURERS, BIRMINGHAM.

No. 48. The "Atlas" Improved Pattern Lamp.



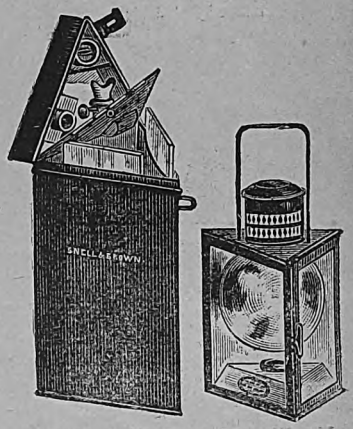
No. 52. Patent Plimsoll Ship Lamp.
Showing Lamp open to remove glass.

No. 59. Ship Side Lights, japanned, galvanized, and copper.

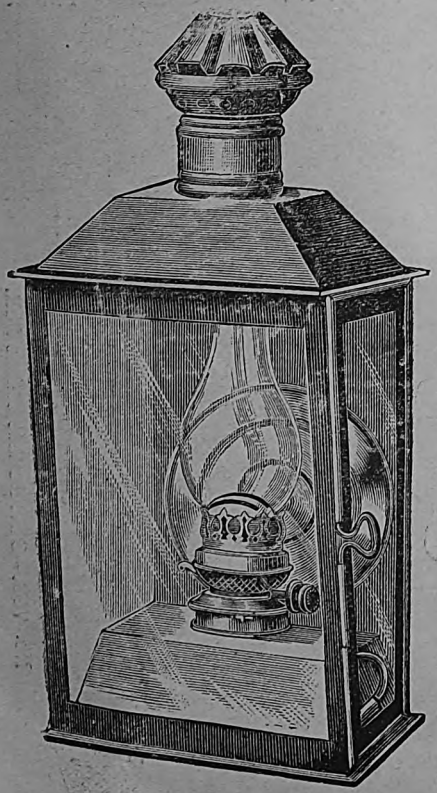


No. 139. Passage or Stable Lantern.

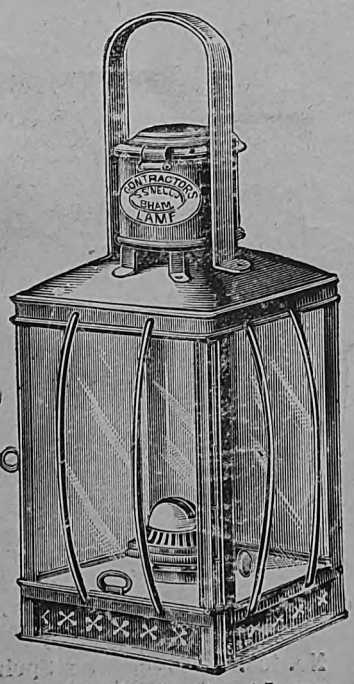
No. 23. Paint removing Lamp.
Made in three sizes.



No. 30. Camp Lamp for oil and kerosine, also candle, and spare glasses for volunteer and other encampments.



Platform or Passage Lamps.
No. 22/1. With Chimneyless Burners.
No. 22/2. With Duplex Burners.



No. 24. Contractors' Lamp,
Largely used for danger signal in road work.

No. 121.—Street Lamp.

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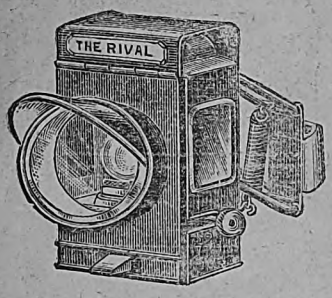
SAMUEL SNELL & Co.,

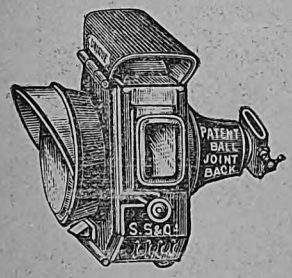
CYCLE LAMP & BELL MANUFACTURERS, BIRMINGHAM.



No. 99. Spring Back Safety Lamp.

No. 100. The Guide Spring Back Safety Lamp.

No. 101. Spring Back Safety Lamp.

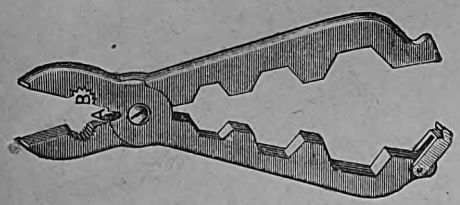


No. 71. Patent Ball Joint Safety Lamp.
Spring covered to prevent rust.
The best Safety Lamp ever invented.

No. 106. Eastern Star.
Concealed Spring Safety Lamp.

No. 72. The Arlington Patent Ball Joint Lamp.
Gives powerful light.

No. 24.—Patent Combined Plyers, Spanner, and Wire Cutter.

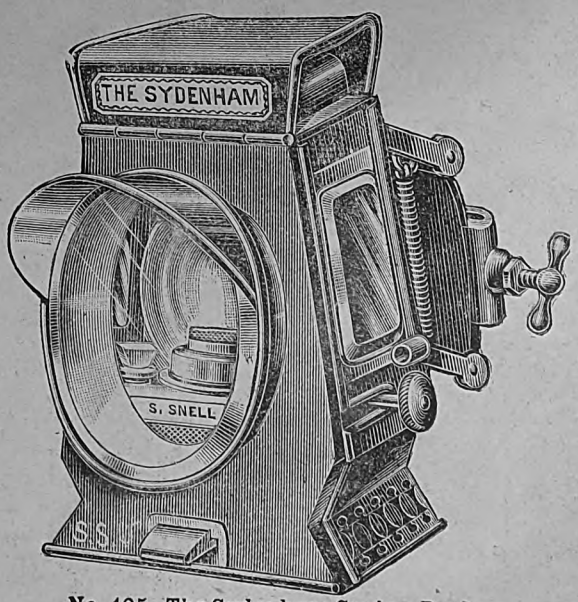


The large demand for these last year is a proof of their efficiency.

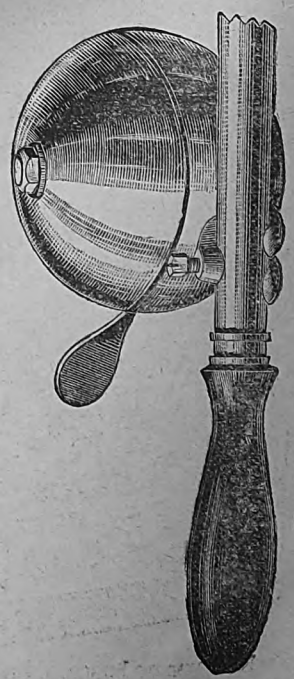
ALL BEST STEEL.

A Rider from the North says of these Plyers:

"My experience over twenty years tells me that this is the only Adjustable Parallel Wrench that will stand the crucial test of tightening upon the pedal pin nut by pressure of the foot. I think that the thanks of the Cycling community are due to you for the introduction of so useful a tool."



No. 105. The Sydenham Spring Back Safety Lamp.



No. 788.—Best Double Chime Bell.

WRITE FOR ILLUSTRATED LISTS AND PRICES.

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This List Cancels all Previous Issues.

Prices are subject to Alteration without Notice.

W. F. DENNIS & CO., 11, Billiter Street, LONDON, E.C.

Telegram Address: "FREDENNIS, LONDON." Telephone No. 4350.

SUBJECT TO ALTERATION WITHOUT NOTICE.

PRICE LIST

OF

FELTEN & GUILLEAUME'S

Patent Galvanized Steel Barb Fencing Wire

STORES: MILLWALL DOCKS, LONDON, E.

HOME TRADE.

PRICES.

ORDINARY TWO OR FOUR BARB.

2 tons and upwards	£20 10s. *per ton.*
Under 2 tons, but not less than 1 ton	£21 10s. „
„ 1 ton „ „ 10 cwt.	£22 10s. „

Delivered Free in ONE LOT. Less than 10 cwt. £22 10s. per ton, carriage forward.

THICKSET TWO OR FOUR BARB.

£2 per ton extra.

TERMS: 2½ per cent. for Cash on 10th of Month following Delivery. Trade References with first Order.

The Wire is made up into Reels of 1 cwt., ½ cwt., or 100 yards, as may be preferred. Reels are charged as follows, viz.:

REELS containing 112 lb.	Free
„ „ less than 112 lb., but not less than 56 lb.	6d. *each extra.*
„ „ less than 56 lb.	1s. „

N.B.—REELS ARE NOT RETURNABLE, & NO ALLOWANCE CAN BE MADE FOR THEM.

LENGTHS PER CWT.

Ordinary Two Barb (Barb 5 in. apart)	560 *yards.*
„ Four „ („ 6 „)	530 „
Thickset Two „ („ 2½ „)	500 „
„ Four „ („ 3 „)	450 „

Customers are requested to see that each Reel bears our TRADE MARK.

F.G. NEPTUNE

MESSRS. FELTEN & GUILLEAUME also manufacture

COPPER WIRE — BRONZE WIRE

BRASS WIRE — PATENT STEEL WIRE

&C. &C.

We shall be pleased to receive enquiries for **Wire of any description,** and to quote special prices upon receipt of specification. Shippers and exporters placed upon exceptionally favourable terms. Correspondence invited.

Kindly TEAR THIS PAGE OUT and keep it handy for future reference.

Sole Agents for FELTEN & GUILLEAUME, Mülheim-on-the-Rhine, near Cologne.

[P.T.O.

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This List Cancels all Previous Issues.

All Prices are subject to Alteration without Notice.

W. F. DENNIS & CO., 11, Billiter Street, LONDON, E.C.

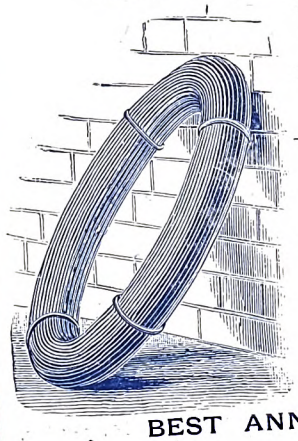
Telegram Address: "FREDENNIS, LONDON."

Telephone No. 4350.

Price List OF WIRE, STRAND, STAPLES, &c.

ALL PRICES ON THIS PAGE ARE IN OUR LONDON STORES, MILLWALL DOCK.

TERMS: TWO-AND-A-HALF per Cent. for Cash on 10th of Month following Delivery.



ROLLED BLACK FENCING WIRE.

No.	1	2	3	4	5	W.G.
	8/3	8/3	8/3	8/3	8/3	per cwt.

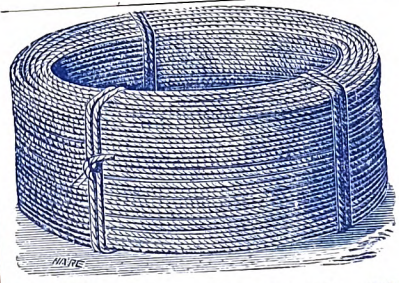
BEST ANNEALED DRAWN SOLID WIRE, BLACK or BRIGHT.

No.	0/6	7	8	9	10	11	12	13	W.G.
	9/3	9/3	9/4½	9/9	10/-	10/1½	10/4½	10/6	per cwt.
No.	14	15	16	17	18	19	20		W.G.
	11/4½	11/10½	12/1½	12/7½	13/1½	14/1½	14/6		per cwt.

BEST ANNEALED DRAWN SOLID WIRE, GALVANIZED.

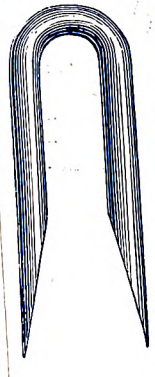
No.	0/6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	W.G.
	11/7½	11/9	12/-	12/4½	12/9	13/-	13/10½	14/6	15/6	16/7½	18/-	20/-	21/10½	24/10½	26/4½	per cwt.

Wire supplied in small hanks is charged at usual extras.



BEST GALVANIZED STRAND, FOR FENCING, &c.

No.	0	1	2	3	4	5	W.G.
3-ply	12/9	13/3	13/7½	14/1½	14/9	15/3	per cwt.
7-ply	14/3	14/6	15/3	15/9	16/6	17/-	,,
No.	6	7	8	9	10		W.G.
3-ply	16/6	17/6	18/9	19/9	20/9		per cwt.
7-ply	18/-	21/-	23/-	24/4½	26/9		,,



STAPLES, SPECIALLY SHARP CUT, TO DRIVE EASILY.

Size		2½ × 5	2 × 6	1¾ × 6	1¾ × 7	1½ × 8	1¾ × 9	
Bright or Black	...	10/10½	11/1½	11/1½	11/3	11/4½	11/7½	per cwt.
Galvanized	...	13/1½	13/4½	13/4½	13/9	14/3	14/9	,,
		1½ × 9	1¼ × 9	1½ × 10	1 × 10		¾ × 14	
Bright or Black	...	11/7½	11/9	14/-	14/3		26/-	per cwt.
Galvanized	...	14/9	15/-	15/9	16/-		33/-	,,

Above prices are for not less than 14-lb. of any one size. Bags are included, but Kegs to hold 1-cwt. of Staples, are charged 1/6 each extra.

MESSRS. FELTEN & GUILLEAUME

ALSO MANUFACTURE

WIRE ROPES of every description for Mining, Ships' Rigging, Hawsers, &c.
CABLES for Telegraph, Telephone and Electric Light.
GALVANIZED TELEGRAPH AND TELEPHONE WIRE.
HIGH QUALITY CAST STEEL WIRE, and all kinds of Wire for HOME or EXPORT.

Sole Agents for FELTEN & GUILLEAUME, Mülheim-on-the-Rhine, near Cologne.

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REGISTERED T.W. TRADE MARK.

WILLIAM WHITELEY,

SUCCESSOR TO

THOMAS WILKINSON & SON,

MANUFACTURER OF CELEBRATED

REGISTERED CORPORATE MARK.

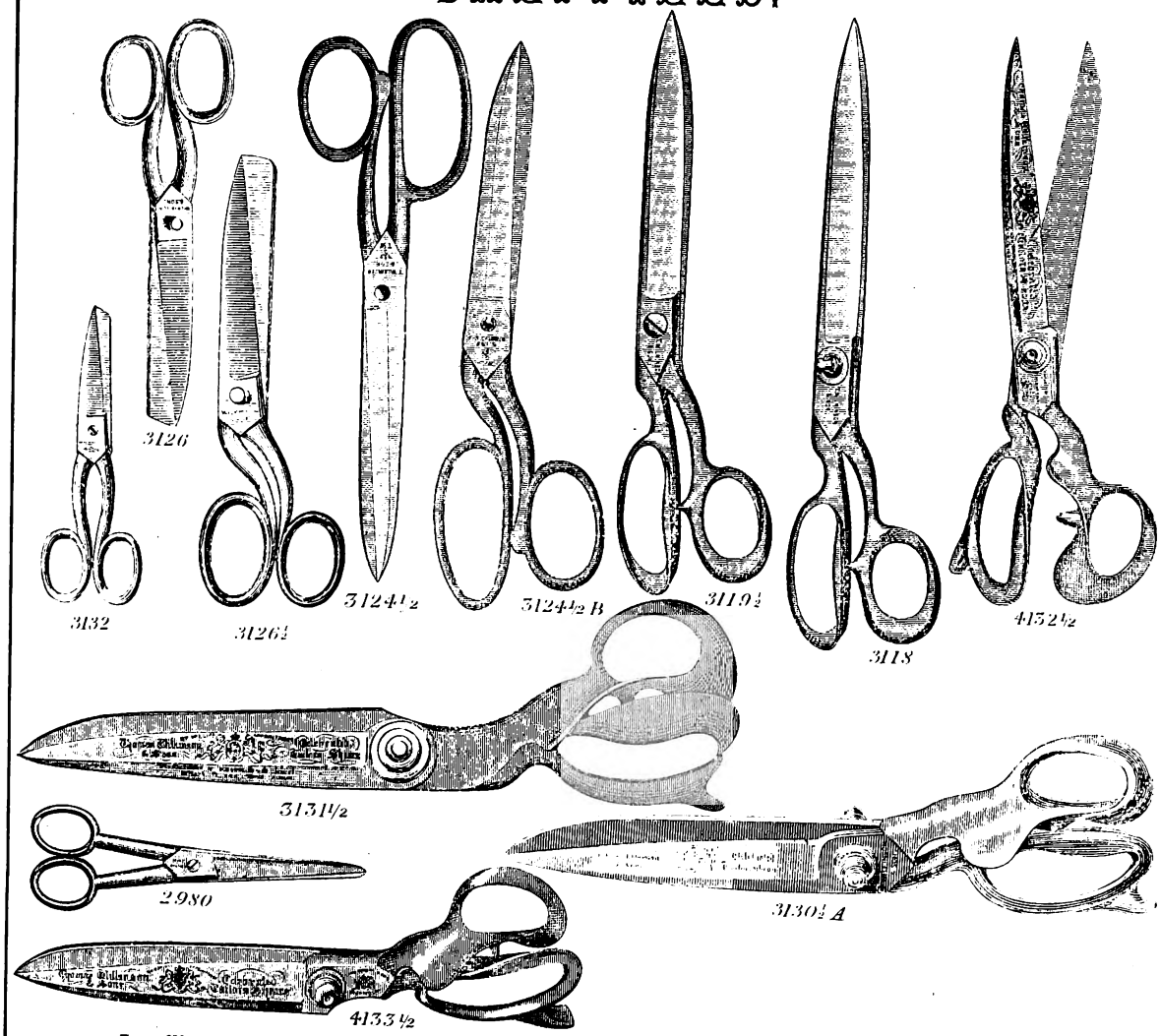
TAILORS' SHEARS,

WITH BRASS, JAPANNED, and GERMAN SILVER HANDLES;

TAILORS' SCISSORS, & SMALL-CUT OR BUTTON HOLE SCISSORS,

Manufactured of the Best Steel, and Tempered with the Greatest Care.

SHEFFIELD.



In calling the attention of our friends and the public to these Shears and Scissors, it is scarcely necessary for us to speak of their superior quality, as the number of years the firm has been established, and the world-wide fame gained by their productions, is a sufficient guarantee that they are unequalled. The blades being of solid steel, made specially and used only by us for these Shears, and wrought, hardened, and tempered by the most experienced workmen; and the handles being made of the most durable material and perfectly fitted to the hand, besides being properly balanced with the blade; the cutter is enabled to get through his work quicker, with more ease and accuracy, than with any other Shears.

NOTICE.—The Scissors and Shears Manufactured by WILLIAM WHITELEY, (Late Thomas Wilkinson & Son,) are Stamped with the above Marks.

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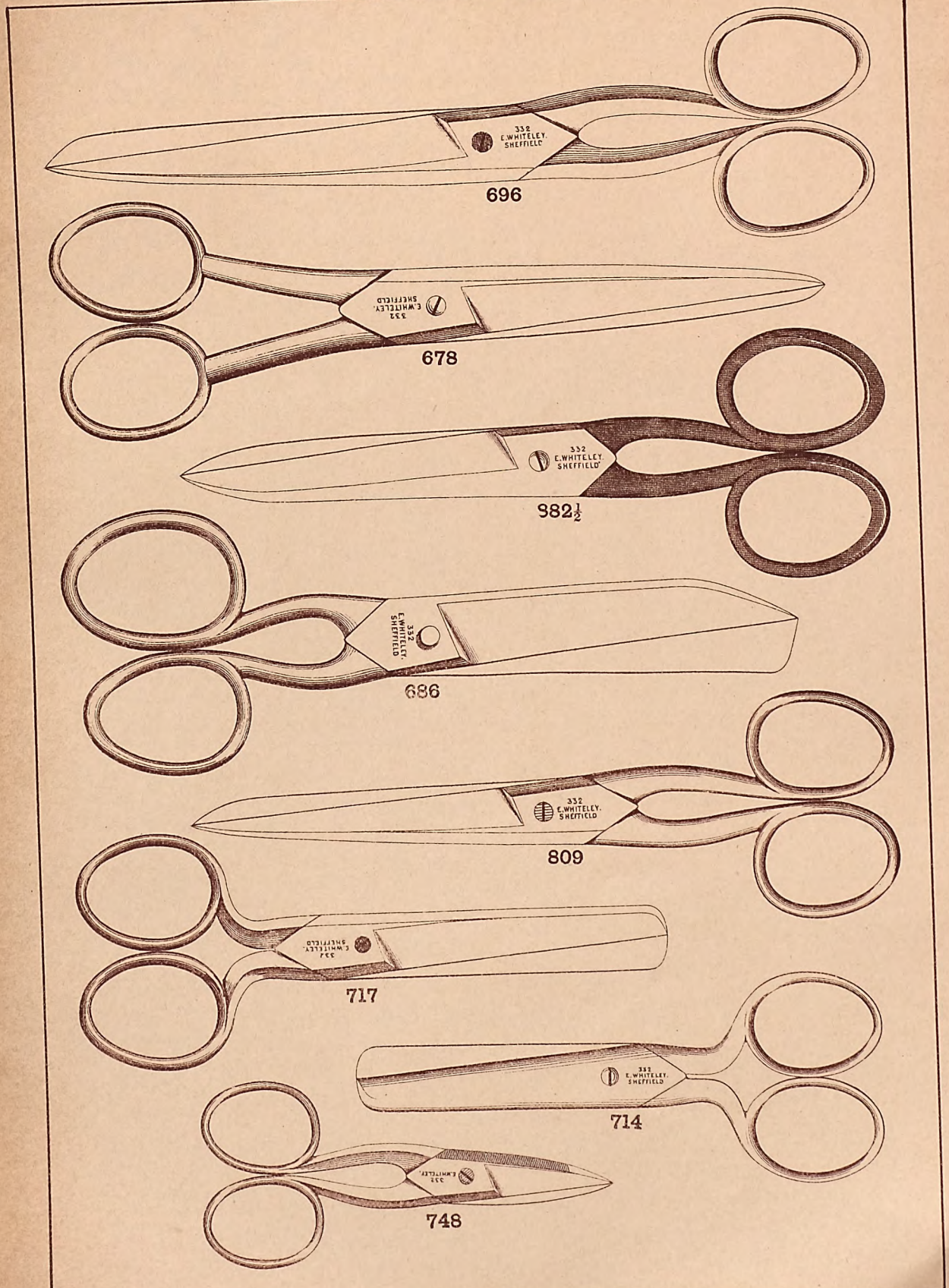

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THE "SYPHON" (REGISTERED TITLE.)

(CLARK'S PATENT)

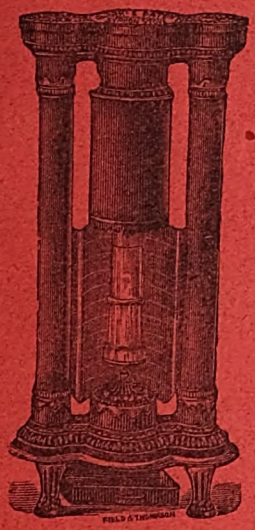
HYGIENIC GAS HEATING STOVES,

FOR USE WITHOUT A FLUE.

NO FLUE REQUIRED. NO SMOKE. NO SMELL. NO DIRT OR TROUBLE. NO DANGER.

All sulphurous Vapours are condensed inside the Stoves, and passed off as a liquid into the tray beneath.

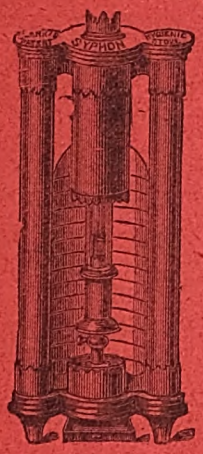
The following are the stock sizes and prices, complete, with a tray and extra glass chimney.



No. 5.

No. 5.—**For Heating and Lighting.** Stands 42-in. high, Argand Burner, consumes 10 feet of gas per hour **when full on.** Suitable for Entrance Halls, Conservatories, large Rooms or Shops. Price **£5**; with polished Copper Side Columns, **15s.** extra. Marble Top, **12s.** extra.

For heating apartments 16 ft. by 16 ft.



No. 2.

No. 2.—**For Heating and Lighting.** Stands 40-in. high, Argand Burner, consumes 8 feet of gas per hour **when full on.** Suitable for Hall, Conservatory, Shop or Bedroom. Price **£3 15s.** With polished Copper Side Columns, **12s.** extra. Marble Top **10s.** extra.

For heating apartments 14 ft. by 14 ft.

No. 8.—**For Heating and Lighting.** Stands 33-in. high, Argand Burner, consumes 6 feet of gas per hour **when full on.** Price **£2 15s.** If with polished Copper Side Columns, **10s.** extra.

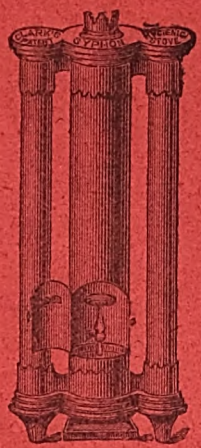
For heating apartments 12 ft. by 12 ft.

No. 1.

No. 1.—**For Heating and Lighting.** Single Pillar Stove. Stands 30-in. high, consumes 6 feet of Gas per hour **when full on.** Suitable for Offices, Landings, Passages, or small Conservatory.

Price **£1 18s.**

For heating apartments 10 ft. by 10 ft.

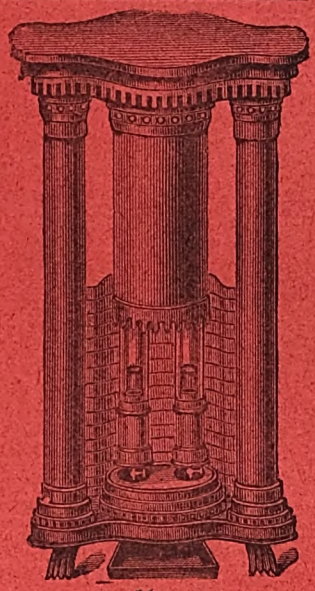


No. 3.

No. 3.—Burns Gas and Air with Bunsen Burner, giving no light. Stands 40-in. high, consumes 9 feet of gas per hour. Suitable for offices, warehouses, halls, passages, shops, &c. Price **£3 10s.**

No. 6.—Similar Stove, only larger. Stands 42-in. high, and of greater heating power; consumes 12ft. of gas per hour. Price **£4 10s.** With Polished Copper Side Columns, **15s.** extra.

No. 9.—Burns Gas and Air with Bunsen Burner, giving no light. Stands 33-in. high, consumes 5 feet of Gas per hour. Suitable for small rooms, passages, &c. Price **£2 15s.**



No. 10.

No. 10.—**For Heating and Lighting.** This is a very powerful Stove, having two Argand Burners. Stands 46-in. high, consumes 16 feet of gas per hour **when full on.** Suitable for large Entrance Halls, Churches, Hospitals, Wards, School-Rooms, Greenhouses, &c., &c. Price, with ornamental Iron Top, **£7 10s.**; If Marbled Slate Top, **15s.** extra; polished Copper Side Columns, **15s.** extra.

For heating Space 18 ft. by 18 ft.

ORNAMENTAL TILE STANDS FOR ABOVE STOVES.

For Nos. 8 and 2 ... **18/-** each.
,, 5 ... **25/-** ,,

Extra Glass Chimneys supplied at 4d., 8d. and 1/- each. Metal Chimneys for use at night when light is not required, 1/-, 2/- and 2/6 each. Also Mica Chimneys, preventing breakage in exposed positions, 2/6, 3/6 and 4/6 each.

Ruby Chimneys throwing a pretty light over the Apartment, 1/6, 2/- and 2/6 each.

Best Skin-covered Flexible Tubing, with Brass Connections for connecting Stoves, in lengths from 4 to 12 feet, 9d. per foot; 1, 2 and 3 feet lengths, 1/- per foot.

The "SYPHON" Hygienic Gas-Heating Stoves give a pure, equable and agreeable heat, which can be graduated and sustained at the will of the user. They are so constructed that a moist or dry atmosphere is obtainable at pleasure.

They are the ONLY SAFE Stoves for use in Greenhouses, Conservatories, Bedrooms, &c., and especially suitable for Halls, Sitting Rooms, Offices, Shops, Schoolrooms, and Theatres.

CAUTION.—The Public are **WARNED** against spurious **IMITATIONS** of Clark's well known **SYPHON STOVES.** See that the words **CLARK'S PATENT** are upon every Stove, without which **NONE ARE GENUINE.**

Full Illustrated and Descriptive Price Lists, with Discounts and Terms, on application to

PATENTEES and MAKERS,

S. CLARK & CO., SYPHON WORKS, PARK STREET, ISLINGTON, LONDON, N.

Telegraphic Address—"SYPHON STOVES, LONDON."

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THE "SYPHON" (REGISTERED TITLE.)

(CLARK'S PATENT)

HYGIENIC GAS HEATING STOVES,

FOR USE WITHOUT A FLUE.

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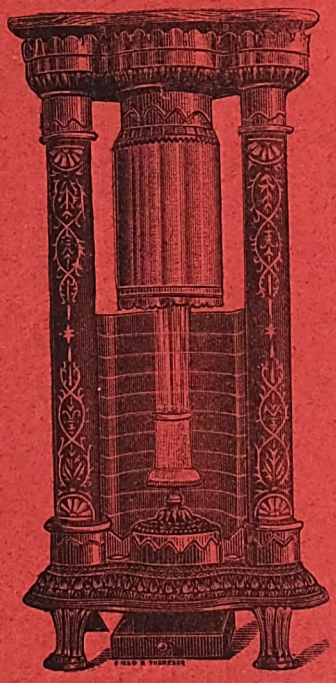
All sulphurous Vapours are condensed inside the Stoves, and passed off as a liquid into the tray beneath.



These Stoves, Handsomely Decorated, can be supplied to suit any class of furniture. Prices on application.

THE SYPHON STOVE IS INVALUABLE FOR USE IN

Halls, Bedrooms, Studios, Conservatories, &c.

NO FLUE is required.

NO SMELL GIVEN OFF.

CLARK'S "PHŒNIX HEATER."

A powerful Oil Stove, fitted with improved Central Draught Burner, for use in **Bedrooms, Conservatories, Halls,** &c.

HANDSOMELY FINISHED IN BLACK AND ELECTRO COPPER.

Fitted with Copper Reflector and Fancy Leaded Glass Panel.

CHEERFUL IN APPEARANCE. *ATTRACTIVE IN DESIGN.*

Full Illustrated and Descriptive Price Lists, with Discounts and Terms, of

S. CLARK & CO., PATENTEES and MAKERS. SYPHON WORKS, PARK ST., ISLINGTON, **LONDON, N.**

Telegraphic Address:—"SYPHON STOVES, LONDON."

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H. DARWIN & CO.,

ST. ANDREW'S WORKS—618 to 622 EGLINTON STREET, GLASGOW,
LIGHTING, HEATING, COOKING, AND VENTILATING GAS ENGINEERS.

THE "DARWIN" PATENTED GAS-FIRES—DOUBLE PATENT.

A NEW DEPARTURE IN GAS-FIRES—IMMENSE HEATING POWER—DIMINISHED GAS CONSUMPTION.

"THE DARWIN"

No. 101 Z.

SIZE—12¼" WIDE, 4¼" DEEP, 14½" HIGH.
PRICE 10s. 6d. EACH, BEST BERLIN BLACKED.
ELECTRO-BRONZED OR BRASSED,
6s. 6d. EACH EXTRA.

TILED STANDS.

PRICES—

7s. 6d., 9s., 10s. 6d., 12s. 6d., 14s. 6d., 16s. 6d., 18s., 21s. each.

According to Size, Character, and Finish, viz., BEST BERLIN BLACKED, ELECTRO-BRONZED, or with HIGH-CLASS TILES.

Fires can be coupled upon either side, right or left, and require a ⅜" Supply Pipe.

"THE DARWIN."

No. 102 Z.

SIZE—14" WIDE, 5" DEEP, 16½" HIGH.
PRICE 14s. 6d. EACH, BEST BERLIN BLACKED.
ELECTRO-BRONZED OR BRASSED, 7s. 6D. EACH EXTRA.

"THE DARWIN"

No. 103 Z.

SIZE—16" WIDE, 5" DEEP, 18" HIGH.
PRICE 18s. EACH, BEST BERLIN BLACKED.
ELECTRO-BRONZED OR BRASSED, 8s. 6D. EACH EXTRA.

"THE DARWIN"

No. 104 Z.

SIZE—19½" WIDE, 5" DEEP, 20" HIGH.
PRICE 21s. EACH, BEST BERLIN BLACKED.
ELECTRO-BRONZED OR BRASSED, 9s. 6D. EACH EXTRA.

The above Stoves are fitted with Plated Trivets.

[OVER.

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EGLINTON TOLL, GLASGOW.

H. DARWIN & CO.,

LIGHTING, HEATING, COOKING, AND VENTILATING

GAS ENGINEERS,

ST. ANDREW'S WORKS, 618 TO 622 EGLINTON STREET, GLASGOW;

Manufacturers of

GAS COOKING STOVES, GRILLERS, BOILING RINGS, CAKE PLATES,

LAUNDRY STOVES, HOT PLATES, COFFEE ROASTERS,

CARVING TABLES, AND A LARGE VARIETY OF OTHER DOMESTIC, LABOUR-SAVING, APPLIANCES,

LABORATORY REQUISITES, ETC.

AN EXTENSIVE ASSORTMENT OF HOT AIR STOVES
ARE IN COURSE OF PREPARATION AND WILL BE READY FOR EARLY DELIVERY IN OCTOBER.

The above Works have been fitted up by the Advertisers with every convenience and modern appliance for effecting rapidity and excellence in the execution of the above class of manufactures, and they believe that the long experience of Mr. DARWIN as a Locomotive, Marine, Mechanical, and Gas Engineer will enable him in the future to surpass all his past efforts in the production of labour-saving tools and appliances in connection with the above business, in which H. D. has invented more than 40 patented appliances, notably amongst them being the Gas-Fires commonly known as "The Main" and "The Wright."

H. D. & Co. are also Proprietors and Manufacturers of

THE "Darwin" REGENERATIVE LAMPS

(PATENTED);

Lighting, Heating, Ventilating.

BEFORE ORDERING ELSEWHERE PLEASE WRITE FOR AN ESTIMATE.

NOTE THE ADDRESS—618 TO 622 EGLINTON STREET,

GLASGOW.

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ESTABLISHED 1844. Telegrams: "Lamps, Glasgow."

Ramsays' Lamp List.

Sole Agents for

Siemens'

Regenerative

Gas Lamps.

THE BEST IN THE MARKET.

Harris & Sheldon's

Shop Fittings

FOR ALL TRADES;

And for

CHAPPIUS'

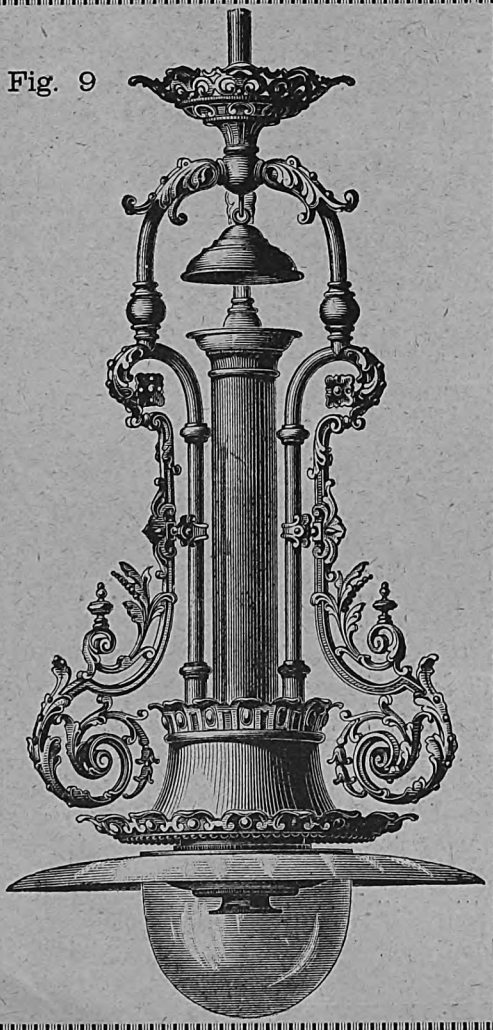
PATENT

DAYLIGHT

REFLECTORS,

For diffusing Daylight in Dark Apartments.

Fig. 9



Manufacturers of

EVERY DESCRIPTION

OF

OUTSIDE LAMPS

FOR

GAS OR OIL,

AND PATENTEES OF

SHOP WINDOW LAMPS.

Ironmongers,

Gasfitters,

Coppersmiths,

Brassfinishers,

Shop Fitters.

Church and Hall

Gas Fittings

A SPECIALITY.

GAS BRACKETS,

HALL LAMPS,

GASALIERS,

PENDANTS

Wm. Ramsay & Co.,

254 Argyle Street, GLASGOW.

(Gasfitting Contractors for the International Exhibition, Glasgow, 1888, and New Municipal Buildings, Glasgow.)

Works: 281 ARGYLE STREET.

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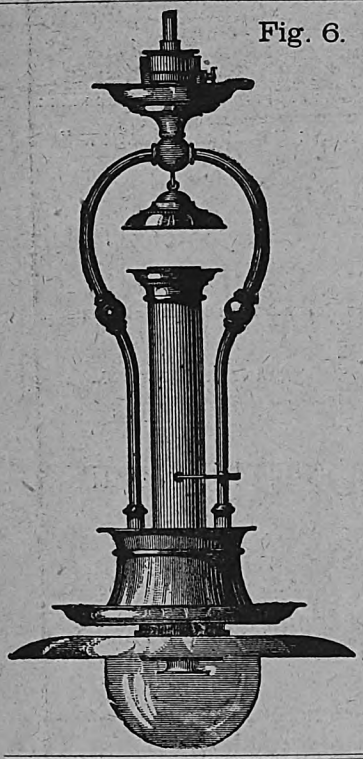
Fig. 6.



Siemens' Circular-flame REGENERATIVE GAS LAMP.

(AWARDED THE GOLD MEDAL OF THE GAS INSTITUTE.)

Burner Nos.	3	4	7	11
Consumption of Gas per hour,	10	15	20	38 c. ft.
Candle Power with Glasgow Gas about - - -	107	178	360	680
Cost per hour with Glasgow Gas about - - -	¼d.	½d.	¾d.	1¼d.

THESE Lamps give a most intense, pure, white light, very beautiful, effective, and economical; after careful testing they were approved and adopted by the Executive of the International Exhibition, Glasgow, 1888, and since then by the Corporation of Glasgow for the New Municipal Buildings, also by the Corporation of Edinburgh, in preference to any other make. They are perfectly smokeless.

NUMEROUS TESTIMONIALS.

PRICES OF VARIOUS DESIGNS.

	Fig. 2.	Fig. 6.	Fig. 4.	Fig. 7.	Fig. 8.	Fig. 9.	Fig. 12.	Fig. 10.	Fig. 11.
Burner, Size No. **3.**	*s.* 102/6	*s.* 110/-	*s.* 120/-	*s.* 125/-	*s.* 140/-	*s.* 195/-	*s.* 235/-	*s.* 370/-	*s.* —
„ **4.**	130/-	137/6	150/-	155/-	175/-	235/-	270/-	430/-	—
„ **7.**	180/-	187/6	200/-	210/-	235/-	335/-	430/-	575/-	725/-
„ **11.**	265/-	275/-	300/-	315/-	335/-	—	—	—	900/-

Each Lamp includes governor, ball joint, reflector, two porcelain cones, and two clear glasses.

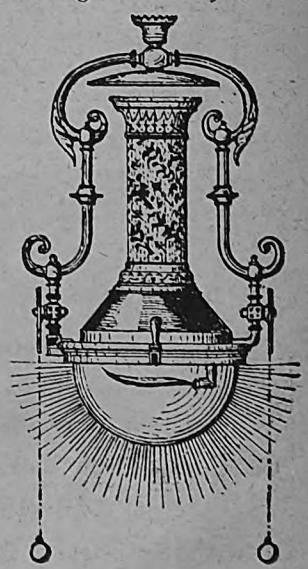
The Lamps are more or less ornamental according to figures and prices.

Horizontal Flat-Flame Regenerative Gas Lamp,

Ordinary Gas Burners adapted to the Regenerative System, producing bright light with great economy.

Consumption of Gas per hour ... ... { 1-flame Lamp about 5½ cub. feet. / 3-flame Lamp „ 15 „

Candle power with ordinary London Gas, ... { 1-flame Lamp „ 60 candles. / 3-flame Lamp „ 170 „



PRICES.

	Without Reflector £ s. d.	With Reflector. £ s. d.
No. 1.—1-flame Lamp (consumption about 3 cub. per hour) complete with governor and ball socket, nickel chimney, and plain pendant	1 15 0	2 2 6
No. 2.—1-flame Lamp, factory pattern complete... ...	——	2 10 0
No. 3.—Do., do., nickel chimney, plain pendant, steel bronze	3 0 0	3 10 0
No. 4.—Do., do., nickel casing, ornamental porcelain chimney, plain pendant, steel bronze ...	3 10 0	4 0 0
No. 5.—Do., do., nickel casing, ornamental porcelain chimney, ornamental pendant, burnished and lacquered, *as per sketch*	4 0 0	4 10 0
No. 6.—3-flame Lamp, factory pattern, complete ...	——	4 10 0
No. 7.—Do., do., with nickel chimney and ornamental pendant	5 10 0	6 0 0

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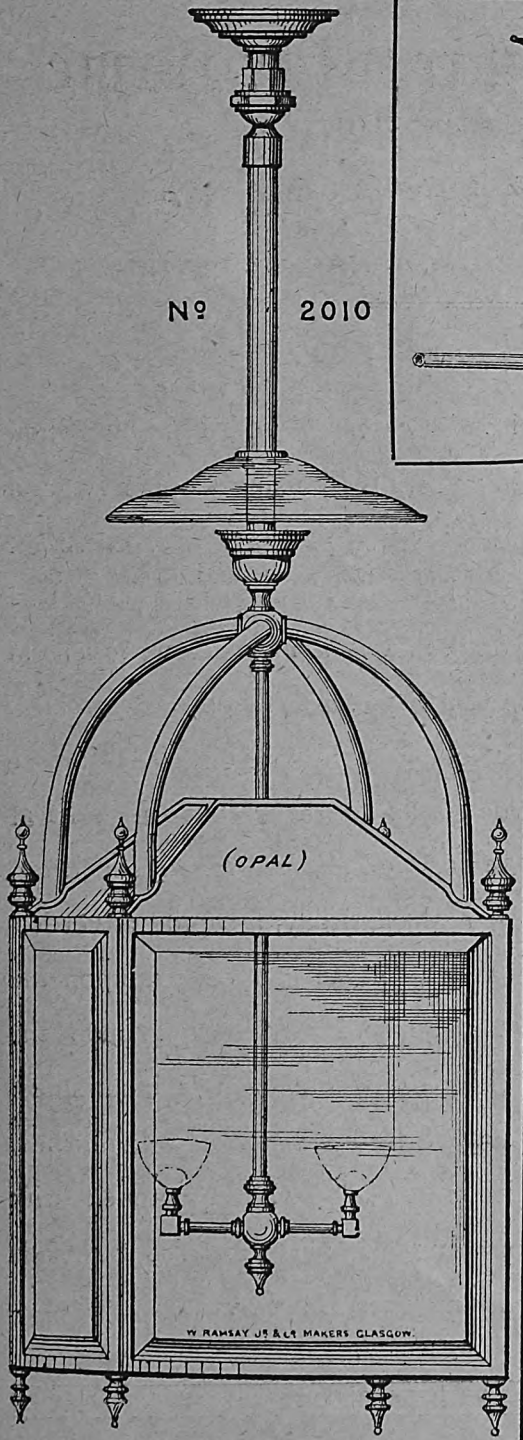
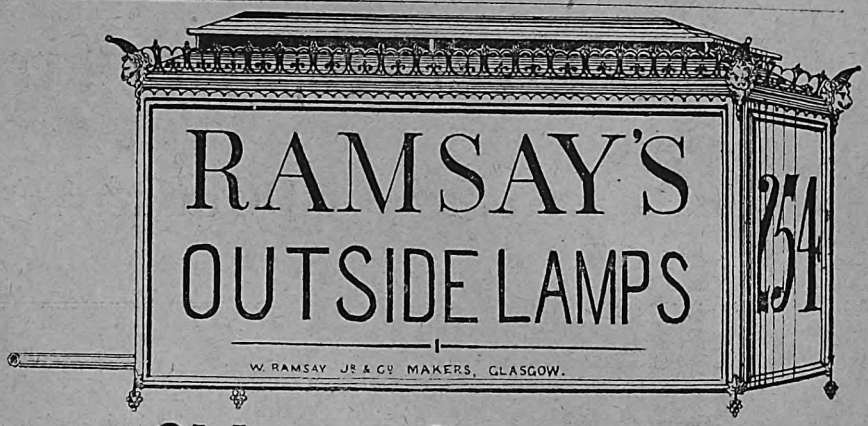


Nº 2010

9, 10, 12, 14, 15 inches.

Entrance Door Lamp.

Polished Brass Frame,
Bevelled Plate Glass Sides,
Opal Deflectors,
Or with Embossed Opal Glass.



Oblong Copper Sign

OR

ADVERTISING LAMP,

FOR SHOP FRONTS,

With Artistically Embossed Glass Sides and Front,
30, 36, 42, 48 inches.

RAMSAYS'

New Copper

Diagonal Lamps,

For Lighting SHOP

and Advertising WINDOWS.

With Three Artistic Four Burners and

Embossed Opal Panes, Suspension Bracket.

No. 1000.

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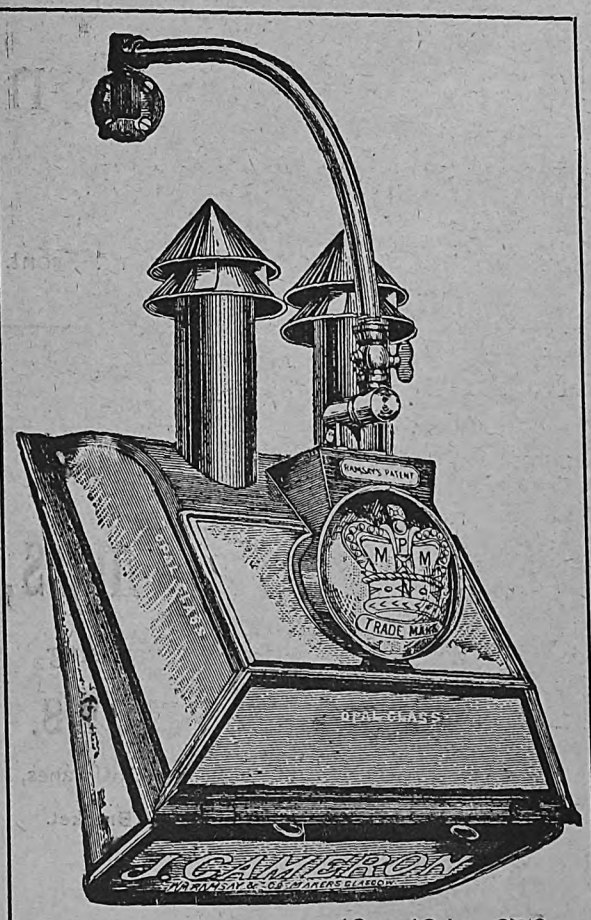
For Jewellers, Hosiers, Drapers, Clothiers, Bootmakers, &c., &c.



18 × 18 in., 87/6.

THE best means of lighting Shop Windows is by using Copper Argand Lamps. **Ramsay's Patent Opal Back Lamp,** shewn here, is of the very best finish only, and is a marked improvement on the Old Style, as thereby the greatest amount of light is utilized, it being so constructed as to throw out the light *at the back* as well as the front; this forms, both by night and day, a capital advertisement, as any name can be put upon the bottom pane and any design upon the lens, whilst the whole back is illuminated. This Patent Lamp is extra well finished, and it is usually white japanned with maroon Funnels, and can also be made with any number of lights.

WM. RAMSAY & CO.,

ARGAND LAMP MAKERS AND GAS ENGINEERS,

254 ARGYLE STREET, GLASGOW.

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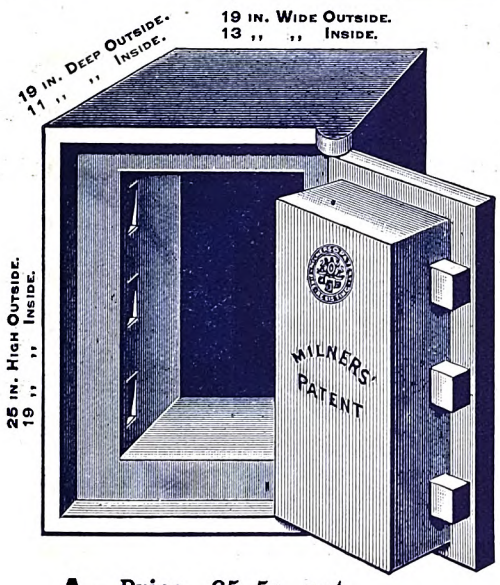
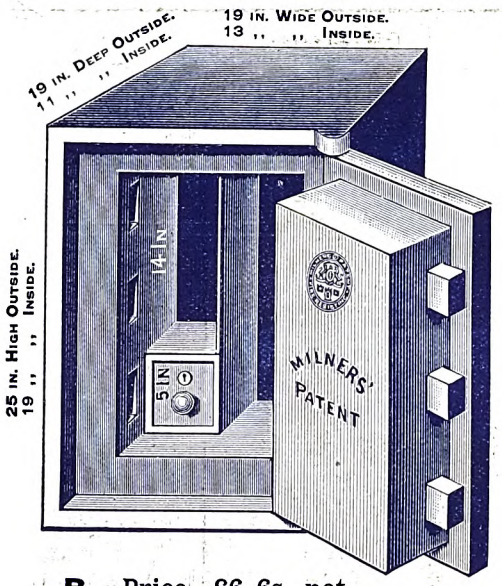
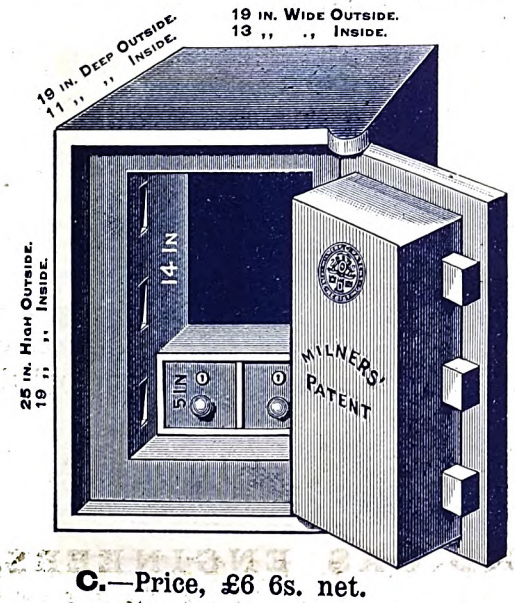
MILNERS' FIRE-RESISTING SPECIAL SAFES



A.—Price, £5 5s. net.



B.—Price, £6 6s. net.



C.—Price, £6 6s. net.

The Prices include carriage to any railway station in the United Kingdom.

Packing cases, 5s. each, which are allowed for if returned in good condition.

MILNERS' SAFE CO., LIMITED.

MILNERS', 28, Finsbury Pavement, E.C.
MILNERS', 28, Market Street, Manchester.
MILNERS', Phœnix Safe Works, Liverpool.

ESTIMATES, DRAWINGS, and PRICE LISTS FREE.

TRADE TERMS ON APPLICATION.

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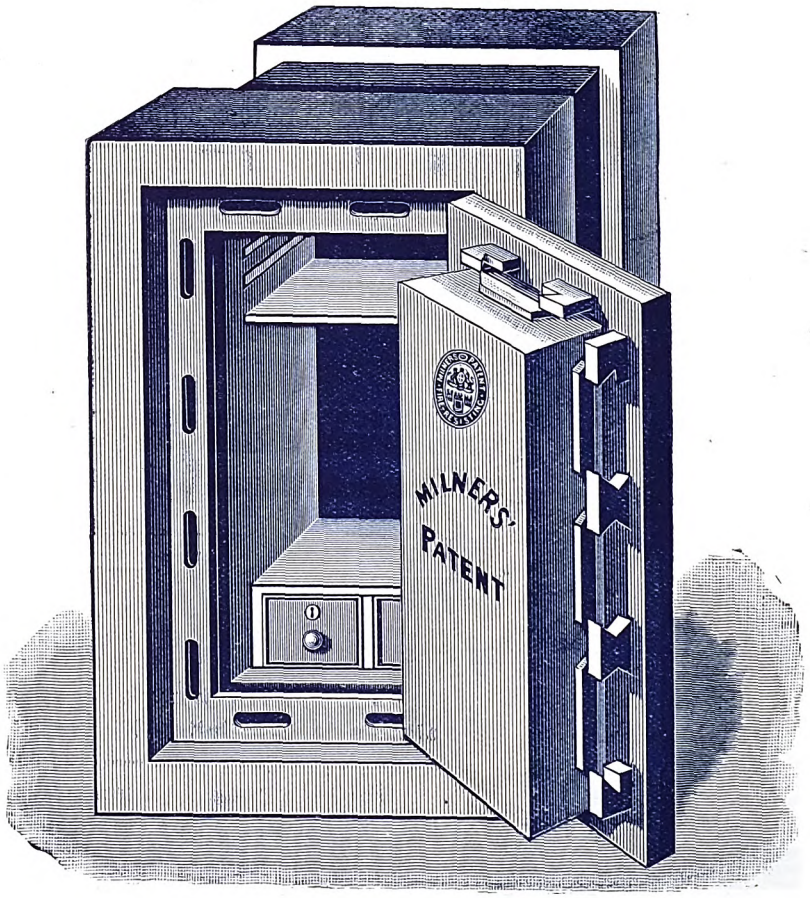
MILNERS'

NEW PATENT

"GRIP BOLT" SAFE.



This latest invention of Milners' Safe Company, Limited, has for its object an improved Safe offering far greater resistance to Burglars than those now existing, and consists of fastenings of a simple and novel design which "grip" the door to all sides of the Safe simultaneously, and is capable of resisting the attack of any known Burglar's Appliance.

Full particulars and Prices on application to

MILNERS' SAFE CO., LIMITED,

28, FINSBURY PAVEMENT, LONDON, E.C.

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FOR

DAINTY DISHES

USE THE

PATENT

"REX"

CHOPPING

MACHINE.

The "KING OF MINCERS."

Chops Suet, Cold Meat, Raw Meat, Mince Meat, Meat for Pies, **CANDIED LEMON AND CITRON,** Fruit, and makes excellent Sausages from beginning to end.

THOUSANDS ARE IN USE, GIVING UNQUALIFIED SATISFACTION. RECOMMENDED BY CONFECTIONERS, AND BY ALL SCHOOLS OF COOKERY

SEE TESTIMONIALS.

FOLLOWS & BATE Ltd., Engineers, Gorton, MANCHESTER.

☞ **Wholesale Net Prices on Application.**

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IMPORTANT TESTIMONIALS.

Opinions of the Press and of Certificated Teachers in Schools of Cookery with reference to the

PATENT "REX" MEAT CHOPPER.

OPINIONS OF THE PRESS.

CASSELL'S FAMILY MAGAZINE, May, 1889.

"The Machine chops admirably; the Mince-meat is turned out in a loose pile or shower, and not in a caked mass as is sometimes the case. The 'Rex' is one of the strongest and best-finished Machines we have seen. It chops Suet admirably."

HYTHE AND SANDGATE ADVERTISER (Our Ladies' Column), March 30th, 1889.

"We do not hesitate to say that not only is the 'Rex' the best we have ever tried, but the *only* one that has given us complete satisfaction.

WELDON'S LADIES' JOURNAL, April, 1889.

"The Patent 'Rex' Meat Chopper will be found a welcome boon to all busy housewives; it does its work better than a knife, it will chop suet with great rapidity to any degree of fineness, and raw meat can be cut without pulping."

MYRA'S JOURNAL, March 1st, 1889.

"I have tested the 'Rex' Chopper, and find it very easy to manage and work, and the result has been in every way a great success. The Machine certainly possesses the advantages that are claimed for it; the manner in which it cuts not only such soft substances as Suet, Vegetables, Cooked or Uncooked Meat, but even Gristle and Sinews, severing them with a clean cut, testifies to the strength and good make of the Chopper."

THE LADY, February 7th, 1889.

"A Perfect Treasure for the Kitchen is Messrs. Follows & Bate's 'Rex' Meat Chopper and Filler."

LADY'S PICTORIAL, February 9th, 1889.

("A Busy Bee.")

"Have you seen the 'Rex' Meat Chopper? It is really a most valuable and useful Machine. Do get one, I feel sure you would be pleased with it. It is such an improvement on the old-fashioned Mincing Machine; and now that Forces are so much used in all the newest Entrées, having a really good Machine is a very great help to a Cook.

THE YOUNG LADIES' JOURNAL, March, 1889.

"The Patent 'Rex' Meat Chopper is an article that should be found in all well-appointed Kitchens; it saves a great deal of time, and does its work much more evenly and well than it can be done by hand; it chops Suet quickly and well; it is a capital Sausage Machine, and is furnished with the needful Tube for filling the Skins."

SCHOOLS OF COOKERY.

From Miss GARSTIN, CERTIFICATED TEACHER OF COOKERY, 103, ABINGDON ROAD, KENSINGTON, LONDON, W.

"Gentlemen—I have now tried the excellent Machine you sent me in all ways, and find it most satisfactory. Anything that will chop Suet so nicely I look upon as a perfect godsend, and for all kinds of meat it is equally good. I shall with much pleasure recommend it at my various Lectures and Classes."

To Messrs. Follows & Bate, Manchester, Dec. 23rd, 1889.

From Miss THOMPSON, PRINCIPAL, NOTTINGHAM SCHOOL OF COOKERY, NOTTINGHAM.

"Gentlemen—I have much pleasure in adding my testimony to that of others in favour of the 'Rex' Mincer. I have tested it in various ways, and find that it works admirably. It does its work quickly and well, and I consider it a valuable addition to the appliances of a School of Cookery."

To Messrs. Follows & Bate, Manchester, Feb. 18th, 1890.

CONFECTIONERS.

From JAMES WALKER, CONFECTIONER, MANCHESTER.

"I cannot speak too highly of your Machine; it has at last supplied a want I have felt for years. I can do all the chopping required to make 240lbs. of Mincemeat in three hours, including Candied Peel, Suet, Apples, &c. The Peel is cut into fine shreds, the Suet is chopped perfectly, and the Apples are delivered in a beautifully smooth and uniform pulp.'

To Messrs. Follows & Bate, Manchester, Dec. 2nd, 1889.

SHOPKEEPERS.

From JAMES REED, KESWICK.

"I am using one of your Patent 'Rex' Meat Choppers, No. 3 size, and I find it an excellent machine for raw meat cutting. I cut a quantity of meat every week, and it works beautifully."

To Messrs. Follows & Bate, Manchester, Jan. 9th, 1890.

From ARTHUR JAMES, NEWPORT.

"I duly received the Patent 'Rex' Chopper and have tried it. I have made Beef Sausages, Pork Sausages, and also chopped some Pie Meat with it. The machine works very well, and I shall recommend it to some friends of mine who keep Dining Rooms."

To Messrs. Follows & Bate, Manchester, Aug. 1st, 1890.

FOLLOWS & BATE Ltd., Engineers, Gorton, MANCHESTER.

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TELEGRAMS,
"AONE," LONDON.

ENTERED AT STATIONERS' HALL.

THE AONE COMPANY

Registered Trade Mark.

Bridge House, 181, Queen Victoria Street, London, E.C.

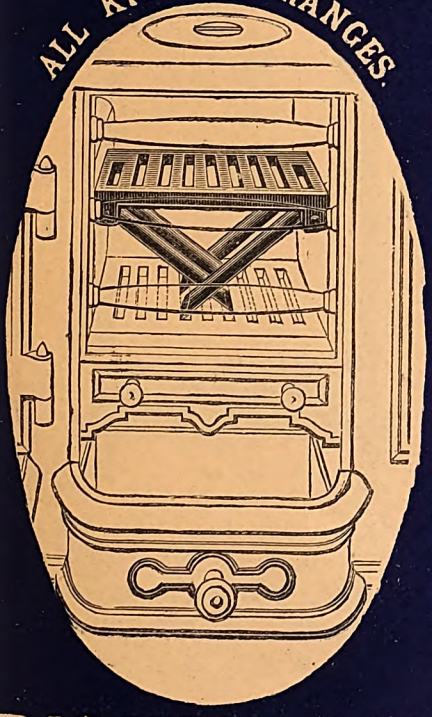
PATENT

FUEL ECONOMISER

OR ADJUSTABLE FALSE BOTTOM.

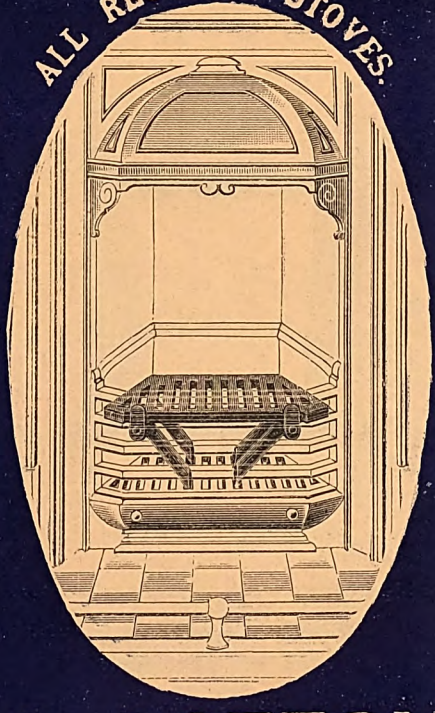
MADE IN HUNDREDS OF SIZES TO SUIT

ALL KITCHEN RANGES.



AND

ALL REGISTER STOVES.



GROSS PRICE

FROM

2/6

EACH.

THE

ONLY

RISING AND FALLING BOTTOM REQUIRING NO FIXING.

SAVES HALF THE COALS

NOW SELLING IN THOUSANDS.

Liberal Terms to the Trade.

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THE AONE FUEL ECONOMISER

IS THE

Only Adjustable Contrivance in the Market

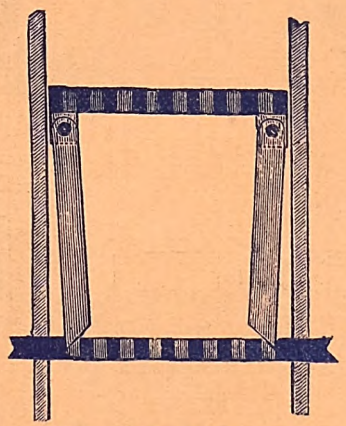
That can be applied to any Kitchen Range or Register Stove

WITHOUT ALTERATION, FIXING, OR ATTACHMENT.

It is in the form of an ordinary false bottom, but with the addition of folding legs or supports, by means of which the height of the fire can be regulated to an inch.

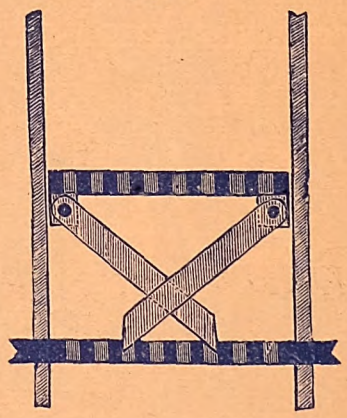
The Sectional Views below show the Economiser in three different positions, but it can be adjusted at any intermediate point—a lifting hook for that purpose being supplied with each.

Fig. 1.



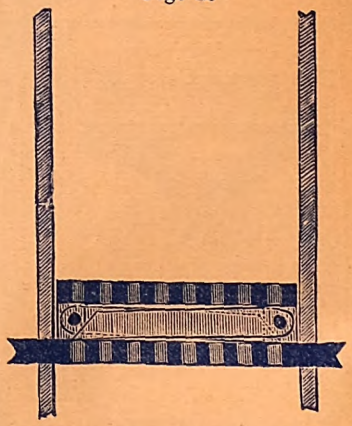
Raised for Small Fire.

Fig. 2.



Adjusted for Medium Fire.

Fig. 3.



Lowered for Large Fire.

To Enlarge Fire.—Use Lifting Hook with one hand, raise the bottom slightly to free legs; with poker in other hand, move legs inwards, and allow bottom to drop to required position. This should be done at each end alternately.

To Reduce Fire.—Pass the Lifting Hook downward through the fire, and with it lift each end alternately to the required height.

General Views of THE AONE ECONOMISER in action are shown on the preceding page.

An exhaustive series of trials of these Economisers, made by independent persons with all kinds of Kitchen Ranges and Stoves, have demonstrated beyond question that they are thoroughly and easily workable, and that their use effects a saving of fuel to the extent of at least FIFTY PER CENT.

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PRICE LIST OF
The AONE FUEL ECONOMISERS for Kitchen Ranges

INCLUDING ONE LIFTING HOOK TO EACH.

The following are kept in stock. Other sizes at approximate rates.

No.	Size.		Price.	No.	Size.		Price.	No.	Size.		Price.	No.	Size.		Price.
	Length	Width.			Length	Width.			Length	Width.			Length	Width.	
	in.	in.			in.	in.			in.	in.			in.	in.	
1	5	4	2/6	26	7	7	5/9	51	9	5	5/9	76	11	8	9/
2	5	4½	2/9	27	7	8	6/	52	9	5½	6/3	77	12	4	6/9
3	5	5	3/3	28	7½	4	4/6	53	9	6	6/9	78	12	4½	7/
4	5	5½	3/9	29	7½	4½	4/9	54	9	7	7/	79	12	5	7/6
5	5	6	4/3	30	7½	5	5/	55	9	8	7/6	80	12	5½	8/
6	5	7	4/6	31	7½	5½	5/6	56	9½	4	5/6	81	12	6	8/6
7	6	4	3/6	32	7½	6	5/9	57	9½	4½	5/9	82	12	7	9/
8	6	4½	3/9	33	7½	7	6/3	58	9½	5	6/	83	12	8	9/6
9	6	5	4/	34	7½	8	6/6	59	9½	5½	6/6	84	13	4	7/3
10	6	5½	4/6	35	8	4	4/9	60	9½	6	7/	85	13	4½	7/6
11	6	6	4/9	36	8	4½	5/	61	9½	7	7/6	86	13	5	8/
12	6	7	5/	37	8	5	5/3	62	9½	8	8/	87	13	5½	8/6
13	6	8	5/3	38	8	5½	5/6	63	10	4	5/9	88	13	6	9/
14	6½	4	4/	39	8	6	6/	64	10	4½	6/	89	13	7	9/6
15	6½	4½	4/3	40	8	7	6/6	65	10	5	6/3	90	13	8	10/
16	6½	5	4/6	41	8	8	7/	66	10	5½	6/9	91	14	4	7/9
17	6½	5½	4/9	42	8½	4	5/	67	10	6	7/	92	14	4½	8/
18	6½	6	5/	43	8½	4½	5/3	68	10	7	7/9	93	14	5	8/6
19	6½	7	5/3	44	8½	5	5/6	69	10	8	8/6	94	14	5½	9/
20	6½	8	5/6	45	8½	5½	6/	70	11	4	6/3	95	14	6	9/6
21	7	4	4/3	46	8½	6	6/6	71	11	4½	6/6	96	14	7	10/
22	7	4½	4/6	47	8½	7	7/	72	11	5	7/	97	14	8	10/6
23	7	5	4/9	48	8½	8	7/3	73	11	5½	7/6	98	15	6	10/
24	7	5½	5/	49	9	4	5/3	74	11	6	8/	99	15	7	11/
25	7	6	5/3	50	9	4½	5/6	75	11	7	8/6	100	15	8	12/6

Directions for Ordering.

For Kitchen Ranges.—The size of the bottom of the fireplace must be given—*length* between sides or cheeks, *width* from inside of front bars to back. The Aone Fuel Economiser must fit loosely.

For Register and other Stoves.—These are made at special prices to suit all stoves. A template or paper pattern of the shape and size of the bottom of the grate must be supplied.

When the bottom of the range or stove is solid or has bars otherwise than from front to back, a loose grating with bars from front to back has to be laid upon it to form a ratchet plate for the ends of the supporting legs to drop into. These gratings are supplied at ordinary prices.

TRADE TERMS ON APPLICATION TO

THE AONE COMPANY,

Bridge House, 181, Queen Victoria Street, London, E.C.

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THE AONE FUEL ECONOMISER

Is unanimously recommended by the Press on account of its possessing the following

IMPORTANT ADVANTAGES:

It is the cheapest rising and falling bottom in the market.

It requires no fixing.

It has no working parts to get out of order.

It is easily adjustable and cannot clog.

It can be applied to any Range or Stove.

It saves half the Fuel.

A handsome Bronzed Iron Show Stand, suitable for the counter, is furnished to the Trade to illustrate the action of the Economiser.

SHOW CARDS and CIRCULARS, with Retailer's Name and Address printed upon them, can be had *FREE* on application to

THE AONE COMPANY,

Bridge House,

181, Queen Victoria Street, London, E.C.

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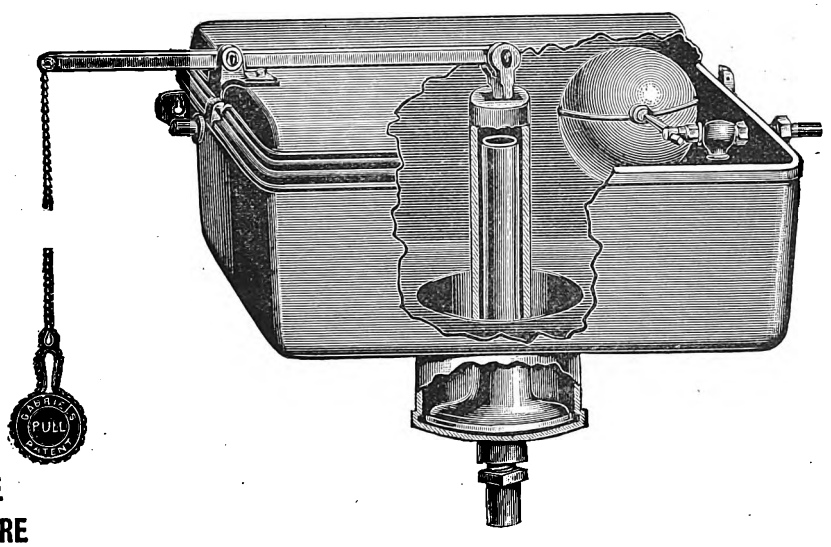
By Her Majesty's Royal Letters Patent.

GABRIEL'S IMPROVED PATENT SYPHON FLUSHING CISTERN,

AND PERFECT WATER WASTE PREVENTER.

PASSED BY THE UNDERMENTIONED LONDON AND PROVINCIAL WATERWORKS COMPANIES:—

LAMBETH
WEST MIDDLESEX
GRAND JUNCTION
EAST LONDON
CHELSEA
KENT
STRATFORD-ON-AVON
WARWICK
LEAMINGTON
CARDIFF
STAFF. POTTERIES
CARLISLE
EAST WARWICKSHIRE
EAST WORCESTERSHIRE



BIRMINGHAM
WOLVERHAMPTON
COVENTRY
RUGBY
NORTHAMPTON
TAMWORTH
WORCESTER
STOURBRIDGE
KIDDERMINSTER
NUNEATON
GLOUCESTER
KENDAL
CARNARVON
CHEPSTOW

GABRIEL & CO. beg to draw the attention of Architects Sanitary Engineers, Plumbers, Builders, and others, to their **PATENT SYPHON FLUSHING CISTERN.** This has been especially constructed to meet a long felt want in the trade, that of a **THOROUGHLY RELIABLE CISTERN** at a **LOW PRICE;** and is fitted with their **PATENT BALL VALVE.** It is **ABSOLUTELY CERTAIN** in action, **SILENT** in use, and very **SIMPLE IN CONSTRUCTION,** and will syphon below water line. The **WELL,** in the bottom of the **CISTERN,** and the upright **SYPHON PIPE** are **ALL CAST IN ONE PIECE,** thus doing away with red lead and other joints, and there are no India-rubber or other valves of any kind to wear or get out of order; the **BELL** being the **ONLY LOOSE PIECE** in the Cistern. The Syphon Pipe being a fixture in the centre of the Cistern, the **LEVER AND BRACKET** are made **INTERCHANGEABLE** and can be worked from either end of the Cistern. The **BALL VALVE AND OVERFLOW** are **ALSO INTERCHANGEABLE** and can be changed to either end. **NO BRACKETS ARE REQUIRED** for fixing this Cistern, there being a strong Lug or Ear cast on the back, with a Hole to take a large size Pin or Screw, and a Slot into which the Cistern drops and becomes firmly fixed. It is a **THOROUGH WASTE PREVENTER,** is neat in appearance, and **CANNOT POSSIBLY GET OUT OF ORDER.** It is strongly recommended as being the best and cheapest yet brought out.

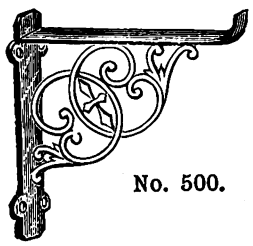
Price, to flush 2 galls. 20/- each.

Pins for fixing same, 4d. per pair.

Ornamental Cast-Iron Brackets, No. 500, 2/- per pair;
Wrought-Iron Brackets, to drive as per drawing, No. 501, 1/6 per pair.

China Pulls, with Brass Chain, 1/6 each extra.

SPECIAL DISCOUNT TO WHOLESALE BUYERS.



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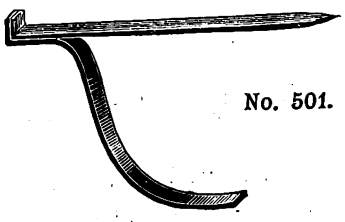

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WORKS:—A. B. ROW, BIRMINGHAM. [SEE TESTIMONIALS INSIDE.

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GABRIEL'S IMPROVED PATENT FLUSHING CISTERN & BALL COCK.

TESTIMONIALS.

From A. A. GILL Esq., CHELSEA WATERWORKS.

"I have tested your waste PREVENTING CISTERN and find that it gives a very good and certain flush, and it appears to me less likely to get out of order than any waste preventer that has come under my notice."

From WILLIAM B. BRYAN, Esq., M.I.C.E., EAST LONDON WATERWORKS CO.

"I have tested the CISTERN which answers very well."

From LYONS WRIGHT Esq., C.E.

"ENGINEER'S OFFICE, TOWN HALL,
"WOLVERHAMPTON CORPORATION WATER WORKS.

"I have examined the waste preventing W.C. CISTERN which you have submitted for my approval, and have the pleasure to inform you that I am quite satisfied with it, and shall permit its use in my district.

From E. J. PURNELL, Esq., C.E., COVENTRY WATERWORKS.

"Your CISTERN is now on the list of those authorized to be used in Coventry."

From J. A. B. WILLIAMS, Esq., M.I.C.E., WATERWORKS, CARDIFF.

"The Patent SYPHON CISTERN submitted by you for approval, being of a satisfactory character will be allowed to be used throughout the District of the Cardiff Corporation Waterworks."

From ADAM H. CAMPBELL, Esq., A.M.I.C.E., STRATFORD-ON-AVON WATERWORKS.

"Both the apparatus (CISTERN AND BALL VALVE) appear compact and suited to the requirements."

From R. O. WYNNE ROBERTS, Esq., CARNARVON WATERWORKS.

"The CISTERN sent me answers very well, there being no intricate machinery about it, nor any fittings to rust or break, I have no doubt it will supersede many others in the market."

From S. G. PURCHASE, Esq., M.I.C.E., "ENGINEER TO THE CORPORATION OF WORCESTER WATERWORKS.

"I have tested the FLUSH CISTERN forwarded by you. It is of very simple construction and not liable to get out of order, and has been approved of by me."

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TESTIMONIALS—*Continued.*

From W. STEWART Esq.. Surveyor, RUGBY

"(URBAN SANITARY AUTHORITY).

"I have inspected Cistern with SPECIAL BALL VALVE, and consider the same very good and undoubtedly an improvement over any other kind I have yet seen."

From The Medical Officer of Health, KENDAL.

"WESTMORELAND COMBINED SANITARY AUTHORITIES.

The Cistern came to hand yesterday, and I have tried it to-day. Its simplicity—you have rightly named it 'SIMPLEX'—and its action is excellent."

From WALTER T. LAYTON, Esq., M.S.E., BROMSGROVE.

"EAST WORCESTERSHIRE WATERWORKS COMPANY.

"I have carefully examined and tested the Patent BALL COCK manufactured by MESSRS. GABRIEL & Co. It is much more compact and reliable than any Ball Cock which has yet been brought under my notice, and appears to me to possess all the points essential to satisfactory working.

"The short, adjustable lever renders it especially suitable for W.C. Flushing Cisterns, and I have no doubt that the simplicity and compactness of the entire arrangement, together with its efficiency in working, will commend it to the attention of all Waterworks Engineers. I do not know any Ball Cock which approaches this in efficiency and reliability under all ordinary pressures."

From LYONS WRIGHT, Esq., C.E., WOLVERHAMPTON.

"ENGINEER'S OFFICE, TOWN HALL,
"WOLVERHAMPTON CORPORATION WATERWORKS.

"Memorandum that I have tested a BALL COCK submitted to me by MESSRS. GABRIEL & Co., and find that it answers all the requirements of such a tap, and has the advantage of a short lever which will permit its use in places where a longer lever could not be used."

From JONAH DAVIES, Esq., C.E., WOLVERHAMPTON.

"PRINCES SQUARE,
"WOLVERHAMPTON.

"I have carefully examined the Improved Patent BALL COCK by MESSRS. GABRIEL & Co., which meets with my entire approval as a long-felt want for reliability and saving water."

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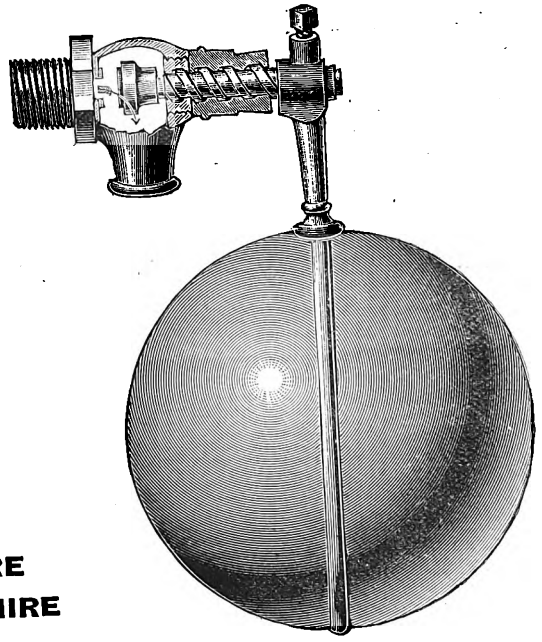
By Her Majesty's Royal Letters Patent.

GABRIEL'S IMPROVED PATENT BALL COCK,

PASSED BY THE UNDERMENTIONED LONDON & PROVINCIAL WATERWORKS COMPANIES:—

LAMBETH
WEST MIDDLESEX
GRAND JUNCTION
CHELSEA
EAST LONDON
KENT
STRATFORD-ON-AVON
WARWICK
LEAMINGTON
STAFF. POTTERIES
CARLISLE
GLOUCESTER
EAST WARWICKSHIRE
EAST WORCESTERSHIRE



BIRMINGHAM
WOLVERHAMPTON
COVENTRY
RUGBY
NORTHAMPTON
TAMWORTH
WORCESTER
STOURBRIDGE
KIDDERMINSTER
NUNEATON
CARDIFF
KENDAL
CARNARVON
CHEPSTOW

GABRIEL & CO. beg to draw the attention of Architects, Waterworks Companies, Plumbers, Engineers, Merchants, and others, to their **PATENT BALL COCK.**

In introducing this Patent, they feel assured it will supply a very long felt want in the trade, viz., that of a **GOOD SOUND BALL VALVE,** one that is **CERTAIN IN ACTION,** and that will entirely **PREVENT THE OVERFLOW OF THE CISTERN OR TANK,** due to the variation in the pressure of water; and the Testimonials from certain eminent Engineers, which will be found inside, will bear out these facts.

This **BALL COCK** has been approved and tested up to a pressure of **300 lbs.** by the Engineer of the City of Birmingham Waterworks Department.

Among the many advantages claimed for this invention we would mention:—

1st.—It is suitable for high or low pressure, and will stand anything up to bursting point.
2nd.—It occupies less space than any other make, the lever in the ½ inch size being only 2½ inches. This is due to the using of a Screw Plug, as with this arrangement it requires less leverage to overcome the resistance of the water.
3rd.—It is the only Valve which has an Adjustable Lever, by which the water in tank can be varied at will.
4th.—It is simple in construction, has a Loose Valve which cannot possibly stick, requires no packing, and cannot get out of order.
5th.—It is reasonable in price, and will be found to answer all the advantages claimed for it.

PRICES.

Screwed Boss for Iron Pipe .. ⅜ inch, **40/-**; ½ inch, **44/-**; ¾ inch, **60/-** per dozen.

Prices of other sizes on application. Special discount to Wholesale Buyers.

Works:—A. B. ROW, BIRMINGHAM.

[SEE TESTIMONIALS INSIDE

KENRICK & JEFFERSON, PRINTERS, WEST BROMWICH & BIRMINGHAM.

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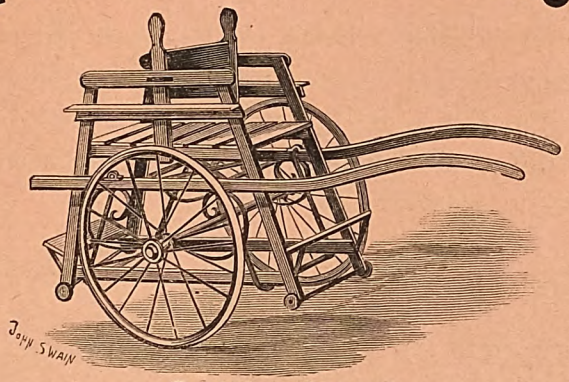
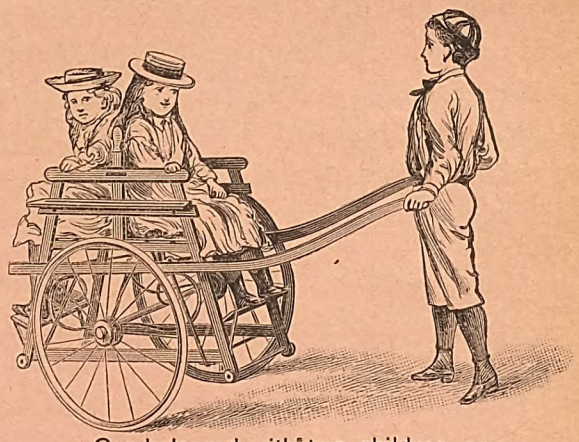
TOZER'S PATENT "BALANCING CAR."



Car balanced at rest.

Car balanced with one child, no weight upon the hands.



Car balanced with two children, no weight upon the hands.

Patented in the chief Commercial Countries of the World.

ADVANTAGES.

We claim the following advantages for our system:—

1. SAFETY.—It is practically impossible for the child to be thrown out.
2. BALANCE.—The Car balances itself whether occupied by one or two children, thereby removing all weight from the arms of the driver.
3. EASE.—Vibration and concussion are reduced to a minimum.
4. ADAPTABILITY.—It can be propelled as safely and comfortably by an adult as by a child.

These Cars can be supplied at different prices, according to the style and finish that may be required, but the principle is the same in all.

Price of Car, as Illustrated, 30/-

[TURN OVER.

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THE principle upon which these cars are constructed is **unique,** and its advantages are so great that they cannot fail to meet with universal appreciation.

Instead of the body and shafts being rigidly fixed together as in the cars now in use, our patent "Balancing Car" is constructed with an independent body, swinging and balancing between the shafts, and suspended therefrom by Strong Iron Cranks, so placed that in all the ordinary positions in which the shafts are held, whether by a child or an adult, the seats remain practically level.

This construction gives a remarkably comfortable and easy motion to the car, reducing concussion and vibration to a minimum, and as there are no stops to catch the ground as in the ordinary construction, it is almost impossible for the child to be thrown out, and thus a most fruitful source of danger is removed.

This Car possesses also the following striking feature **not possessed by any other,** viz.:—that, whether one or two children occupy the seats, it readily adjusts and balances itself, so that there is **no weight** upon the arms of the person propelling it. Owing to this balancing action, the seats remain practically level, and it permits of the car being driven equally well by an adult or a child, without danger of the Car striking the ground; this is done automatically without adjusting the shafts.

With these improvements our Patent "Balancing Car" becomes a **perfect** Child's Carriage, being free from the danger and discomfort inseparable from rigidly constructed vehicles, so that delicate and young children may use them without fear of injury, and Ladies can propel them with the greatest ease and comfort.

The Illustrations, to which we call attention, shew faithfully the action of the Car under varying circumstances.

Full particulars upon application to the Patentees—

JAMES H. TOZER & SON,

BOTOLPH HOUSE, 10, EASTCHEAP, LONDON, E.C.

Makers and others are invited to correspond with us with a view to granting licences at Home and Abroad.

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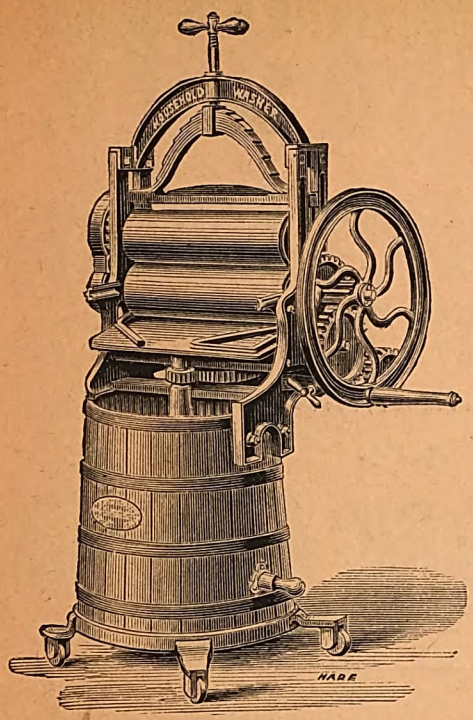
The 'Household' Washer



Having the greatest variety of Patterns, and the Largest Works, and the Biggest Stock of anyone in the trade, we are able to execute orders with great despatch.

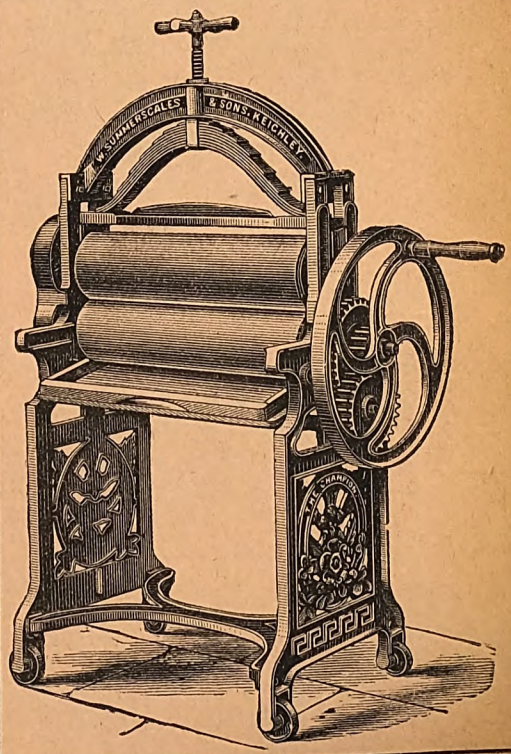
Lists and full particulars Free.

W. SUMMERSCALES & SONS
CONEY LANE WORKS, KEIGHLEY.

The Trade only supplied.

The 'Champion'

Can be fitted either with or without Patent Roller Bearings.



Our Machines have always given such very great satisfaction, and our trade has increased to such an extent, that we have been obliged to extend our premises several times.

All orders entrusted to our care shall have our very best attention.

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W. SUMMERSCALES & SONS,

Coney Lane Works & Phoenix Foundry

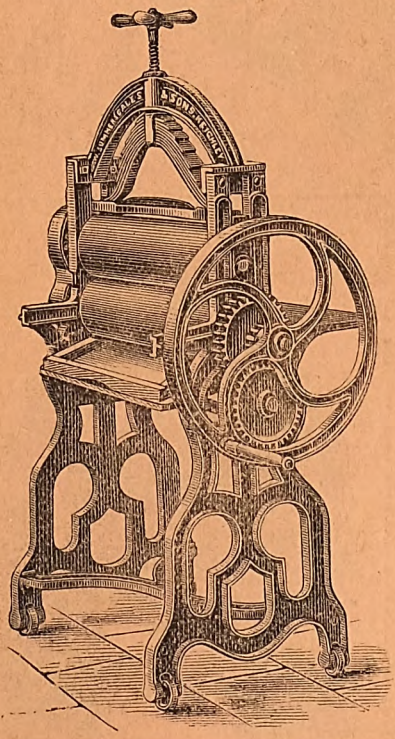
KEIGHLEY.

LARGEST MAKERS OF

WASHING, WRINGING & MANGLING MACHINES

IN THE WORLD.

The Old Favourite.
No. 39.



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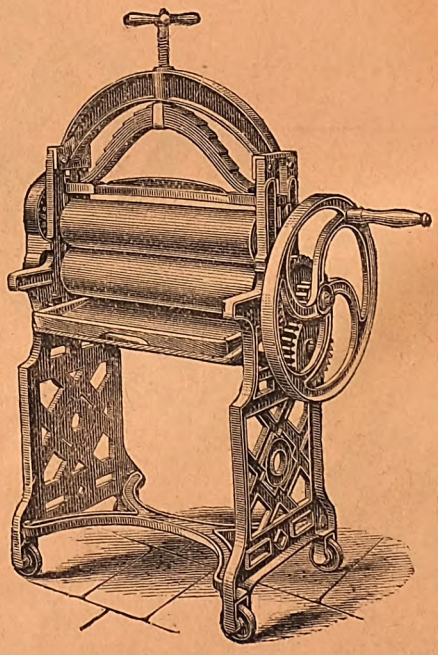

All our Machines are now fitted with Patent Board-holder, and all the latest improvements, and are the cheapest (taking quality into consideration) of any Machine now before the public.

Lists and full particulars free on application.

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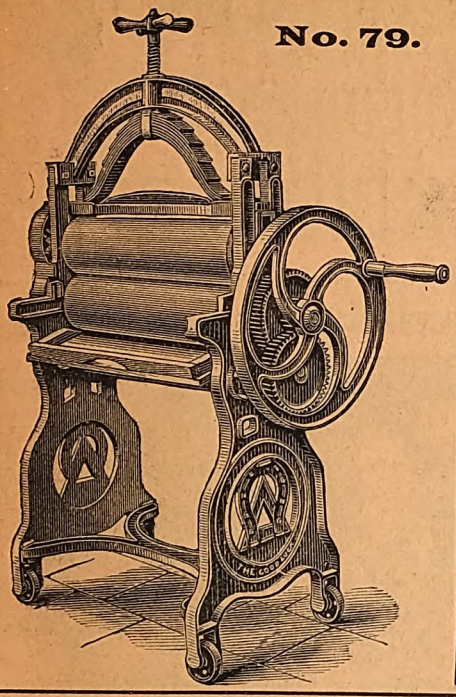
The 'GOOD LUCK.'

No. 79.



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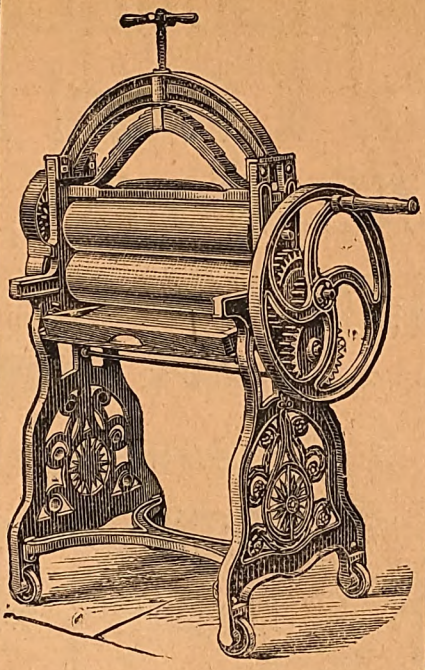


Our continued success and increase of business speaks well for the favour with which our Machines are received on all hands.

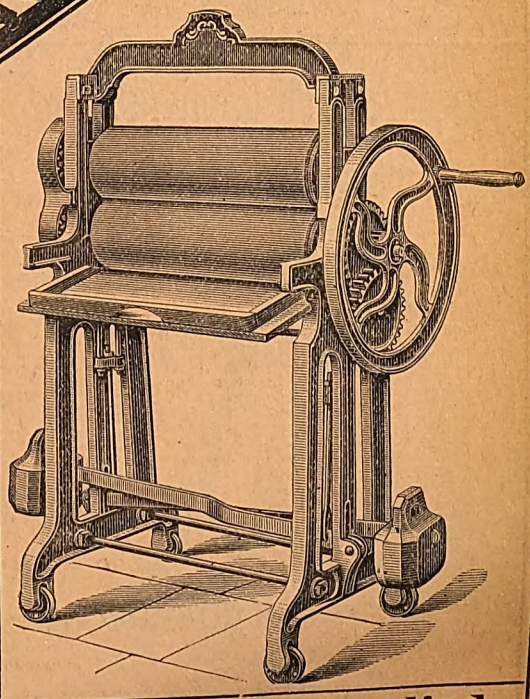
It is always our endeavour to turn out a good, well-finished, and useful Machine.

All Orders and Indents through Merchants and Shippers shall have our careful attention.

W. SUMMERSCALES & SONS
CONEY LANE WORKS, KEIGHLEY.

No. 75

IMPROVED LEVER & WEIGHT **MACHINE.**



These Machines are constructed upon the best Lever and Weight principle, and are the most simple and efficient Wringing and Mangling Machine in the Market.

Lists and full particulars Free. **The trade only supplied.**

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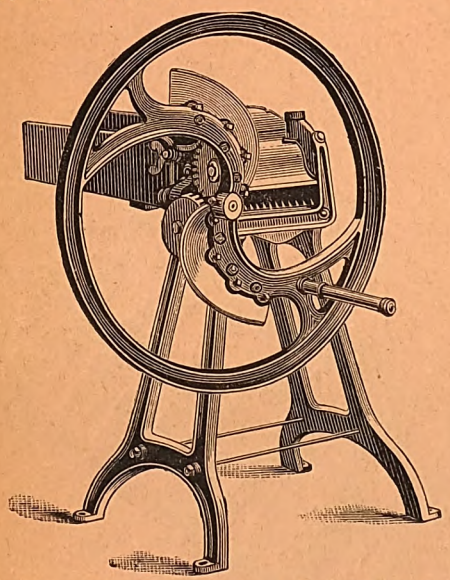
W. SUMMERSCALES & SONS,

Agricultural & General Engineers,

CONEY LANE WORKS, KEIGHLEY.

No. 1 CHAFF CUTTER.



Chaff Cutters of every variety, for Hand or Steam Power.

TELEGRAMS:

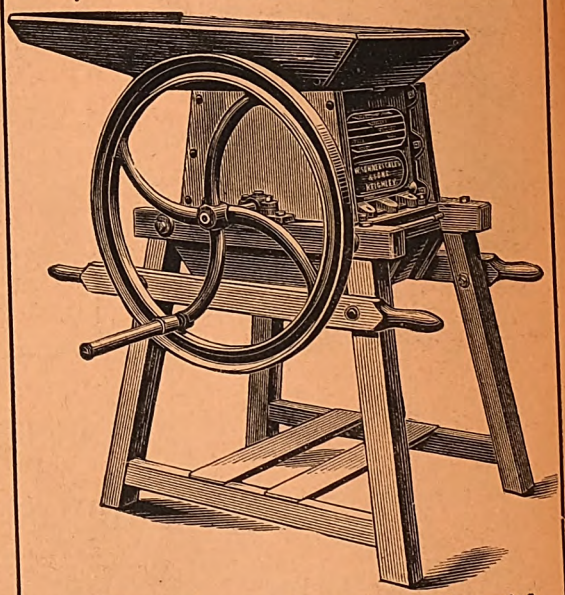
'PHŒNIX,'

KEIGHLEY.

Established

1850.

Improved Gardner's Turnip Cutter.

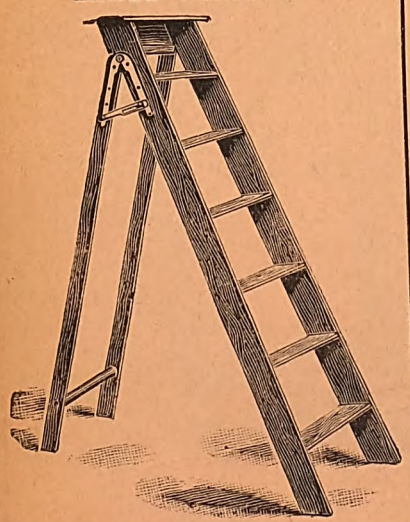


The above can be made with either Wood or Iron Frame, Turn-over or Fixture Hopper, and all the latest improvements.

PATENT

'SAFETY' STEP LADDERS.

LARGE VARIETY.



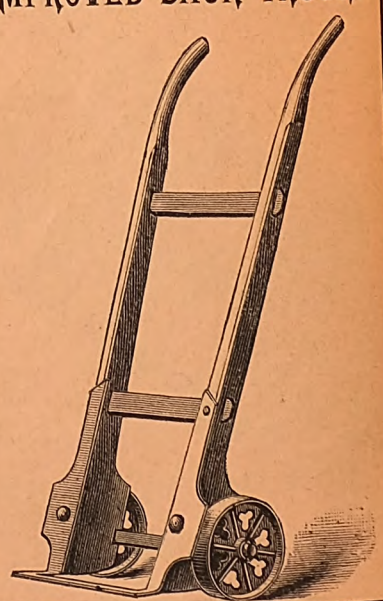
We beg to draw special attention to our

"SAFETY"

STEP LADDERS,

of which we are sending out large numbers as they are light, but firm and strong.

IMPROVED SACK TRUCK.



Lists Free on application.

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W. SUMMERSCALES & SONS,

PHŒNIX STEEL WORKS,

KEIGHLEY

WHEELS CUT. PATTERNS MADE.

MAKERS OF

STEEL CASTINGS

QUOTATIONS

ON APPLICATION.

A TRIAL SOLICITED.

Correspondence invited.

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W. SUMMERSCALES & Sons,

LAUNDRY ENGINEERS,

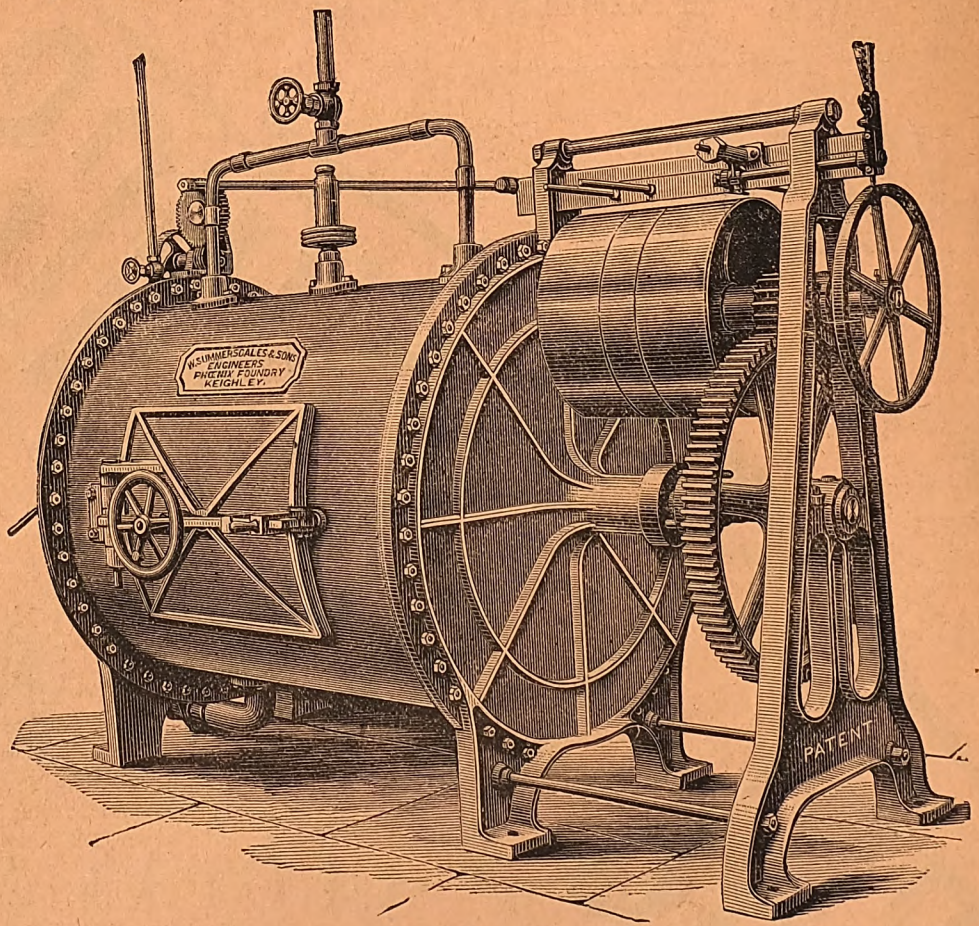
PHŒNIX FOUNDRY, KEIGHLEY.

SUMMERSCALES' PATENT

* * "PRACTICAL" * *

Washing and Disinfecting Machine.

Prices and Full Particulars Free.



Plans and Full Particulars for all kinds of Laundry Work Free.

Is made entirely of metal, and consists of an outer cylinder of mild steel $\frac{3}{8}$in. thick, made in one piece, the longitudinal seam welded, and the flanges at both ends turned by machinery. The ends or covers are of cast iron, strongly ribbed and truly faced in the lathe, having bored and turned stuffing boxes and glands in their centres. The periphery of cylinder is provided with a hinged steam-tight door for loading and emptying Machine. An inner cylinder of brass or other metal, and perforated, rotates within the above, into which the linen to be washed is put. The inner cylinder has a Patented Reversing and Locking Motion, worked by an automatic arrangement. The former causes the Machine to change its direction of rotation every few revolutions, and thereby prevents the twisting and roping of the linen, so disastrous in other machines; the latter locking the starting gear when standing, and at once removing what has always been a source of danger to the attendant of washing machines—the possibility of the machine starting during the operation of loading or emptying. The Machine is fitted with a **Steam Inlet Valve, Water Supply Valve,** and **two Test Cocks** for regulating the height of water in cylinder; **Dead Weight Safety Valve,** and **Emptying Cock of large dimensions.**

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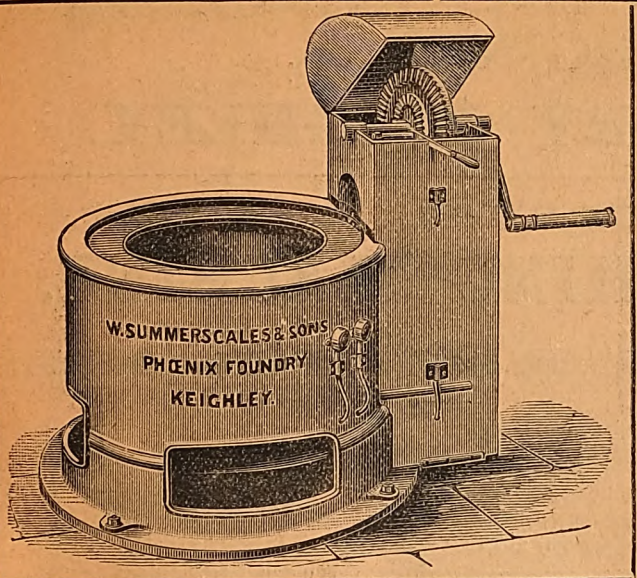
LAUNDRY ENGINEERS



HYDRO EXTRACTORS

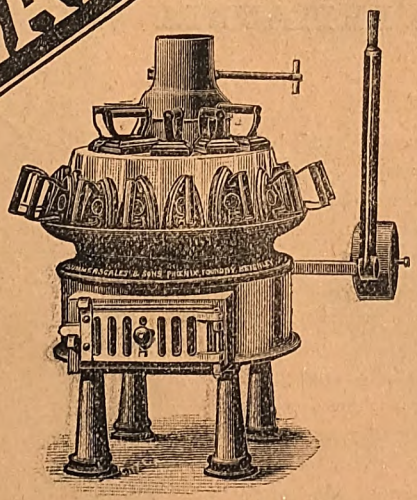
of every description
for Hand or Steam
Power.

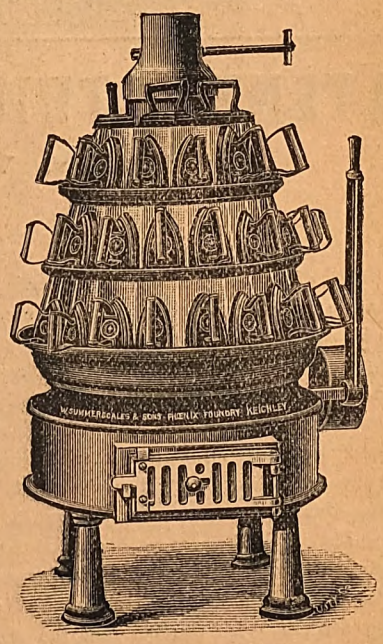
W. SUMMERSCALES & SONS CONEY LANE WORKS, KEIGHLEY.

Lists and Full Particulars Free.

THE 'CHELTENHAM' IRONING STOVE

Acknowledged to be the most practical Laundry Stove in the Market.





TELEGRAMS:
"PHŒNIX"
KEIGHLEY.

Possesses the following advantages:—

Small consumption of Fuel, with ample room for combustion, utilising the hot gasses to the best advantage.

Perfect control of fire by the air ventilator to ash chamber and damper in smoke flue.

Improved method of cleaning the grate bars.

Thorough cleanliness, the ashes falling into an enclosed chamber.

Great durability, the form of construction dispensing with all acute angles, and provision being made in each section for contraction and expansion.

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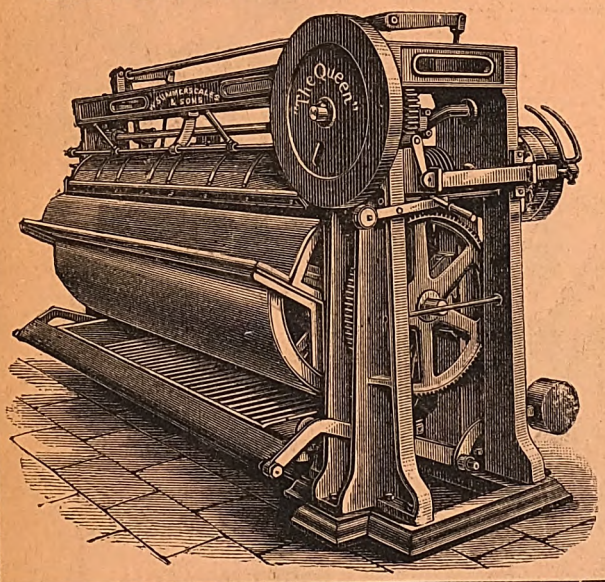
W. SUMMERSCALES & SONS,

LAUNDRY ENGINEERS,

PHŒNIX FOUNDRY, KEIGHLEY.

THE "QUEEN"

IRONING & FINISHING MACHINE.



Advantages claimed for "THE QUEEN" over other Machines.

1st.—Originality of Design.
2nd.—Simplicity of Construction.
3rd.—The small power expended to drive it, only one belt being required.
4th.—The large amount of work it will turn out in a day.
5th.—The economy in labour. Unskilled girls readily operate it.
6th.—No complicated working parts to get out of order.
7th.—No steam joints directly over roller to get leaky, and damage the linen passing through.
8th.—The much longer life of the Felt on these Machines in comparison with others.
9th.—The ready means for stopping and starting the Machine, and raising the Irons.

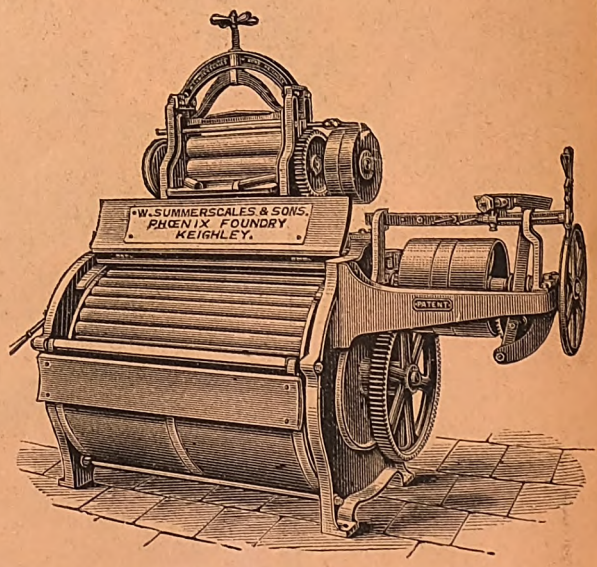
—o—

The Machine is self-contained, and requires no special foundation, is made throughout of best materials, and high-class workmanship, and every part tested before leaving our works.

PATENT "TRIUMPH" WASHING MACHINE,

Fitted with BRITANNIA WRINGER.

Consists of two heavy cast-iron ends, having in their centres truly bored and turned stuffing boxes and glands. The ends are stayed apart to the required distance by strong stays, with turned and faced collared ends abutting on to machined facings on the end castings, thus securing correct, mechanical, and permanent adjustment, entirely independent of the body of the machine, which, being an unknown quantity, owing to expansion and contraction, gives much trouble in other machines. Our practical friends will at once see the important advantage of this form of construction. The revolving drum is fitted with our new patent Automatic Reversing and Locking Motion, the former reversing the motion of the machine every few revolutions, the latter locking the starting gear when standing, and at once removing what has always been a source of danger to the attendant of washing machines—the possibility of the machine starting during the operation of loading or emptying. The gearing is carried by a strong box section bracket, which, together with the seatings on the end, is machine faced and strongly bolted.



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LAUNDRY ENGINEERING WORK.

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THE

"Matchless" Electric Gas Lighter

PRICE (in Box)

10/6

The Best in the Market

W&R

THE

"Matchless" Electric Gas Lighter

PRICE (in Box)

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Thousands in Use

The "Diamond" Dry Battery

The Latest Improvement in this direction

Large Stock Kept
Prompt Delivery Guaranteed

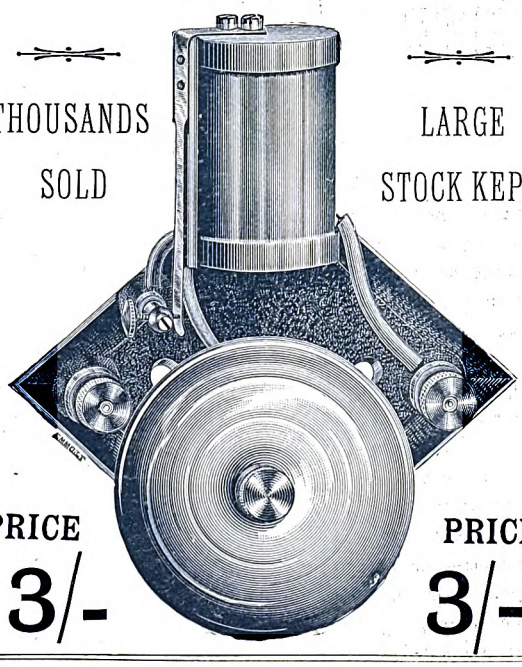
PRICES

No. 1 — $6\frac{3}{4}$ ins. High	× 3 ins. Diameter,	...	4/
No. 2 — $3\frac{3}{4}$ „	× $2\frac{1}{8}$ „	...	3/
No. 3 — $2\frac{5}{8}$ „	× $1\frac{3}{4}$ „	...	2/6

The "Diamond" Electric Bell

THOUSANDS SOLD

LARGE STOCK KEPT



PRICE **3/-**

PRICE **3/-**

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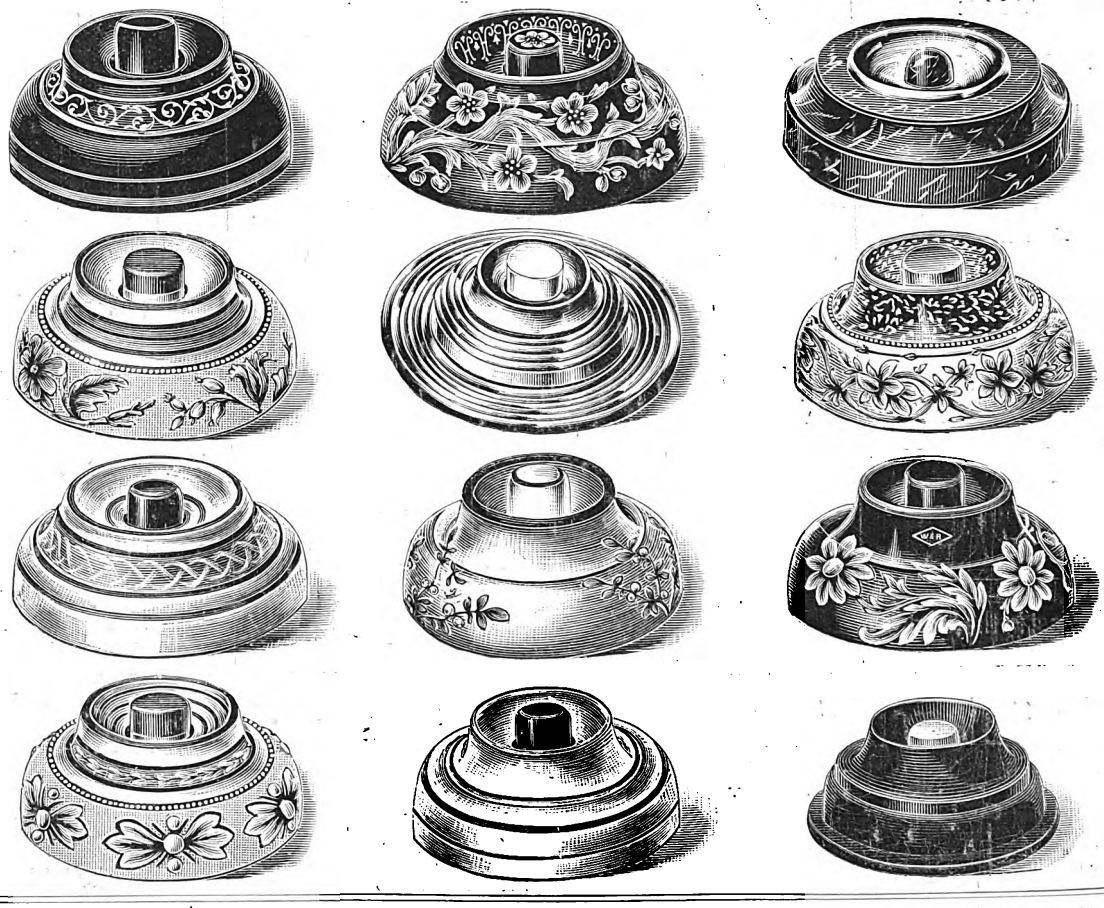
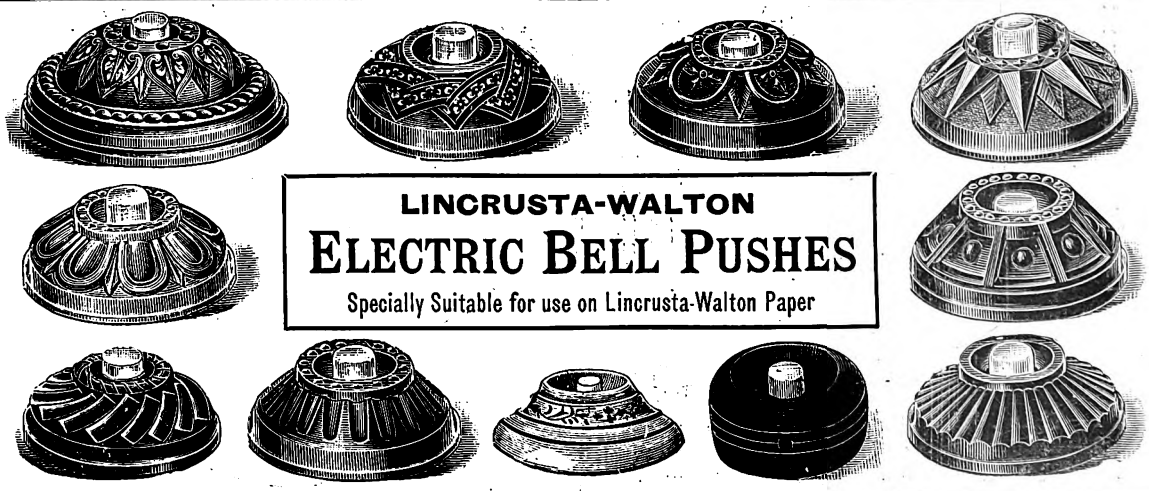
PORCELAIN ELECTRIC BELL PUSHES

The following represent a few only of the large number of Patterns which we can supply:





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ELECTRIC BELL PUSHES

Specially Suitable for use on Lincrusta-Walton Paper

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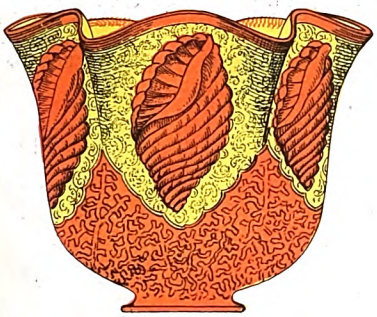
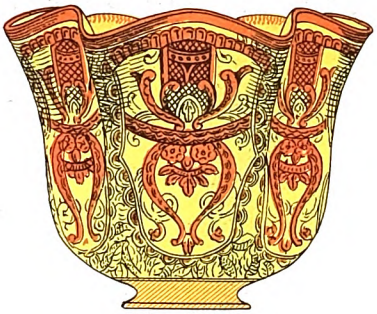
EDWARD J. SHAW & CO'S PATENT "MURANO" GLASS,

IS NOW MADE IN RUBY, BLUE, CITRON, AND OLD GOLD, AND IS UNRIVALLED FOR BEAUTIFUL COLOURS AND RICH EFFECTS.



No. 4170.



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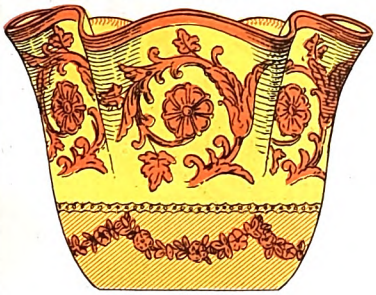

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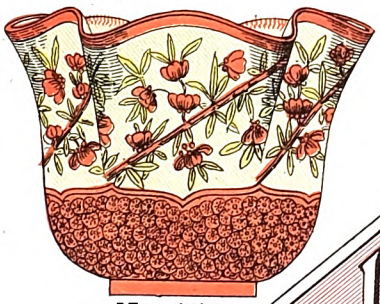

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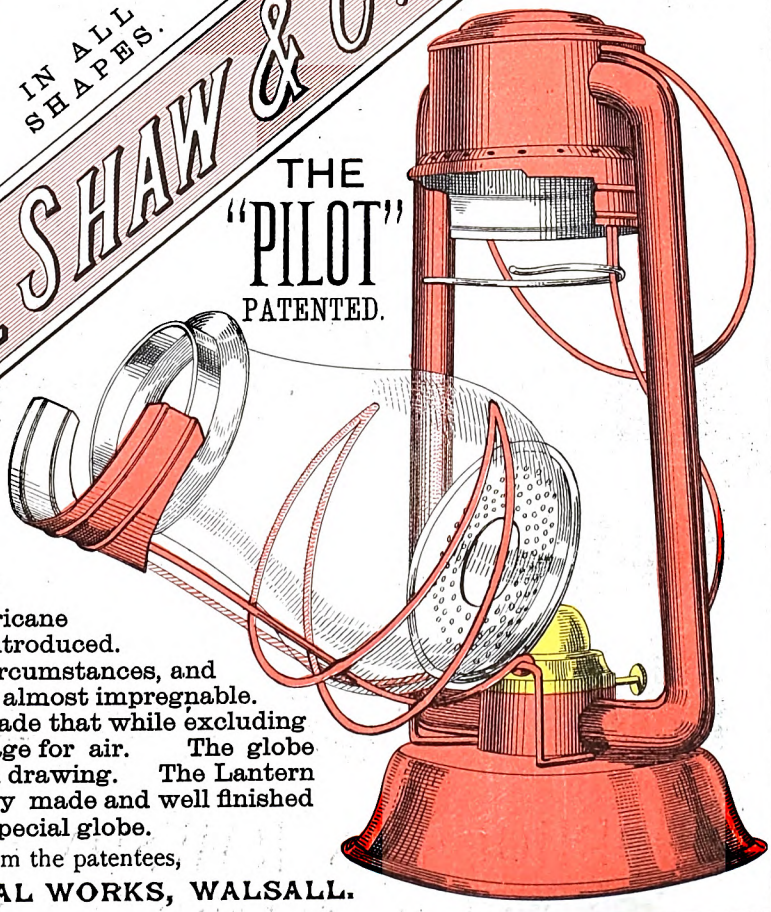
REGISTERED DESIGNS.

IN ALL SHAPES.

ENGLISH MADE.

EDWARD J. SHAW & Co. WALSALL

THE "PILOT" PATENTED.



The only really windproof Hurricane Lantern yet introduced.

It will burn under any circumstances, and in any storm. It is almost impregnable.

The protecting "hood" is so made that while excluding the wind it allows a free passage for air. The globe opens for lighting as shewn in drawing. The Lantern is japanned red, very strongly made and well finished throughout, and requires no special globe.

To be obtained only from the patentees,

E. J. SHAW & CO., ASTRAL WORKS, WALSALL.

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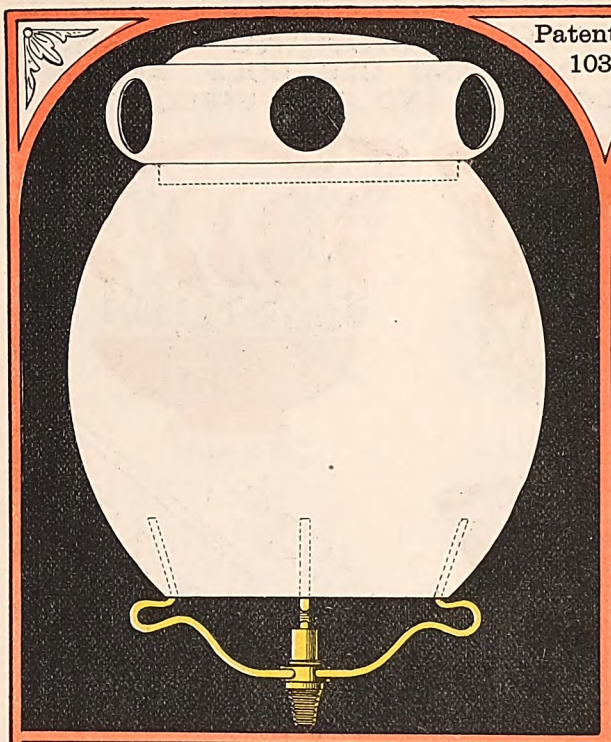


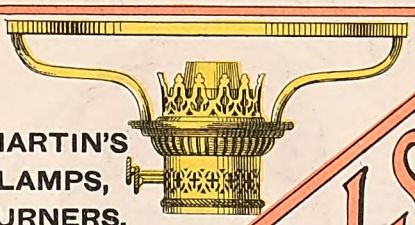
Patent No. 10347.

The "SIAM" CORONET

Is a perfect smoke preventer. It will fit any ordinary globe. It is made entirely of opal glass, annealed so as to stand any amount of heat without breaking. The "SIAM" Coronet does not impede the diffusion of light like a metal coronet and reflects perfectly.

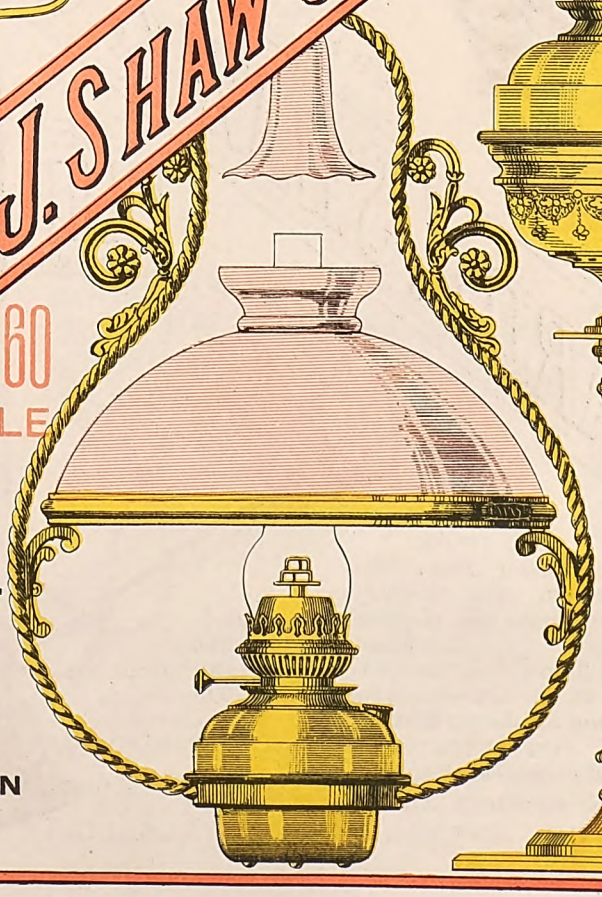
PATENTS ARE BEING APPLIED FOR ABROAD.
STEPS WILL BE TAKEN AGAINST ANY INFRINGEMENT.

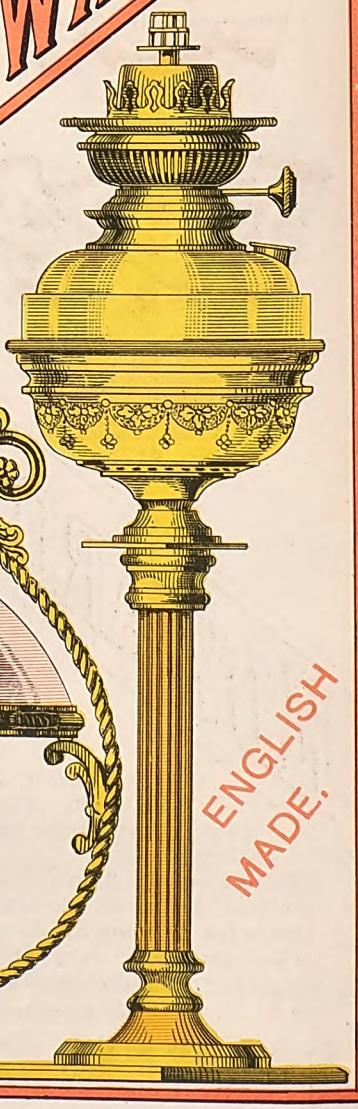
EDWARD J. SHAW & Co. WALSALL



MARTIN'S LAMPS, BURNERS, WICKS & CHIMNEYS.

60 CANDLE POWER.





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CENTRE-DRAUGHT
"BRUNEL"
TABLE & SUSPENSION
LAMPS.

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Established 1785.

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COPPERSMITHS,

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ART AND GENERAL METAL WORKERS,

DESIRE TO CALL THE ATTENTION OF THE TRADE TO THEIR

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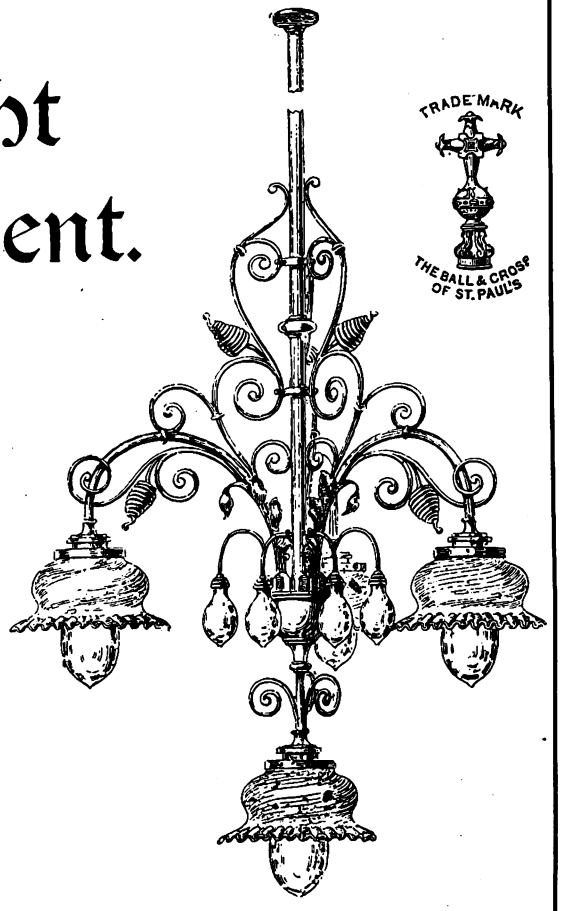

They will be glad to submit Designs and Estimates of

Electroliers,

Brackets,

and every description of other

Electric Light Fittings.

On the other side will be found a few Representations of some of B. & F.'s leading Manufactures.

A VISIT TO THEIR SHOW ROOMS IS RESPECTFULLY INVITED.

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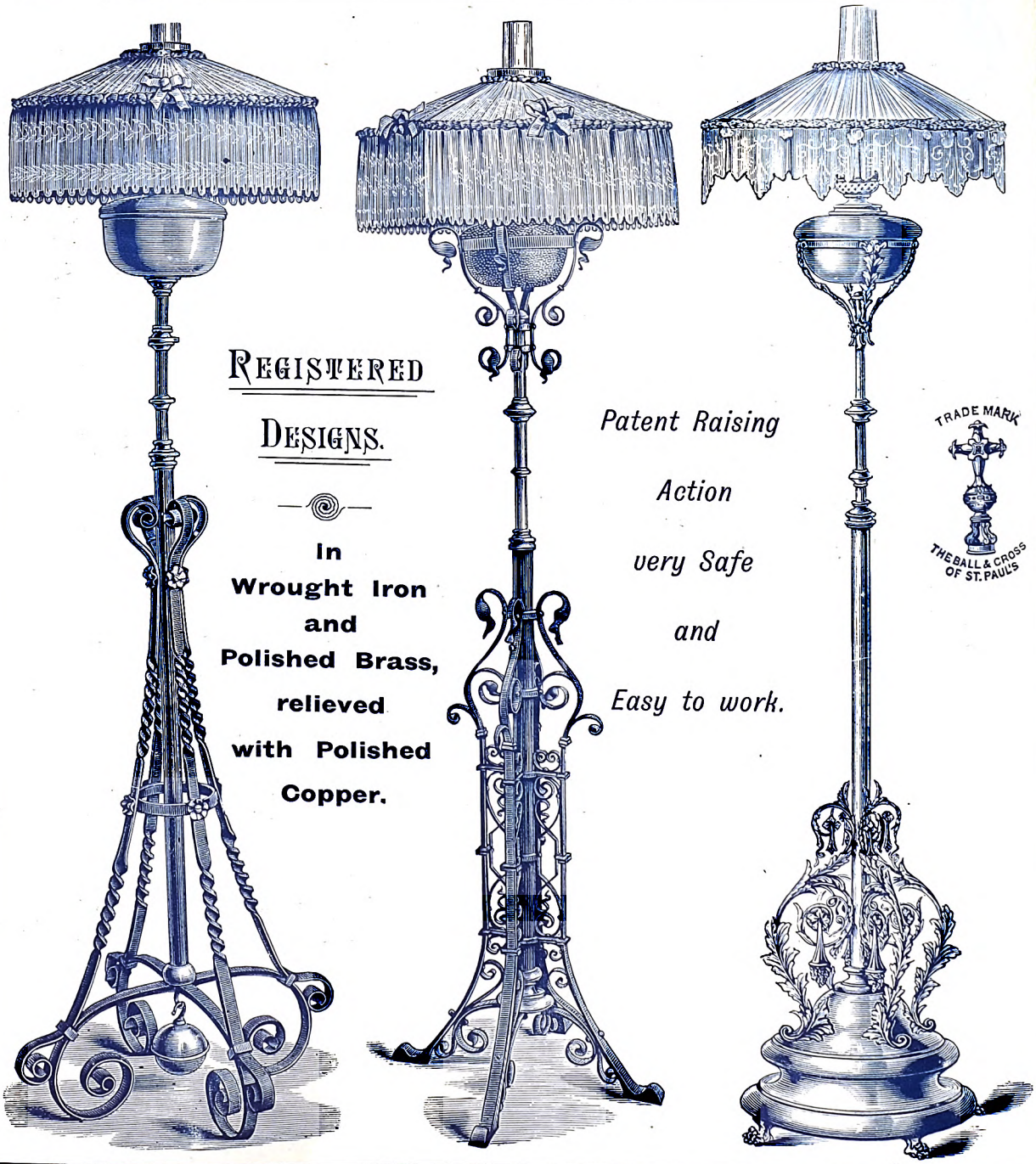
Pedestal Floor Lamps.



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In Wrought Iron and Polished Brass, relieved with Polished Copper.

Patent Raising Action very Safe and Easy to work.

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Wood Coal Boxes,

AND

BRASS AND COPPER COAL SCOOPS.

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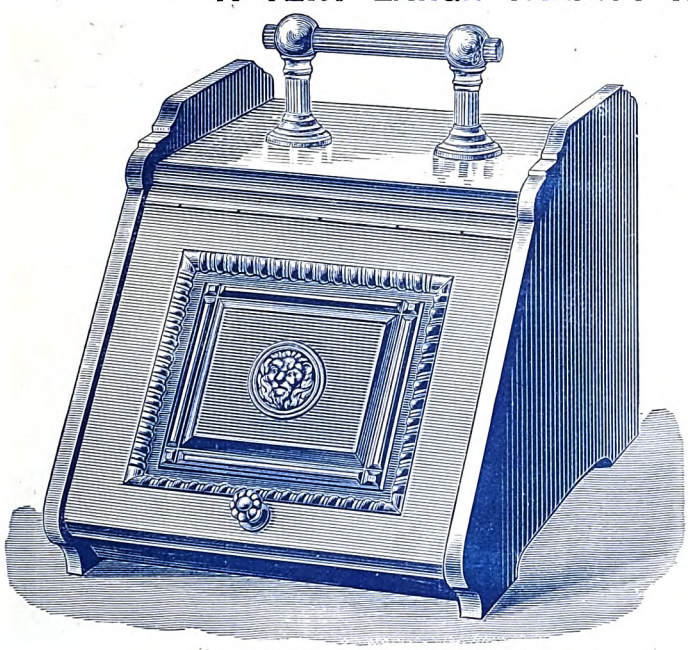
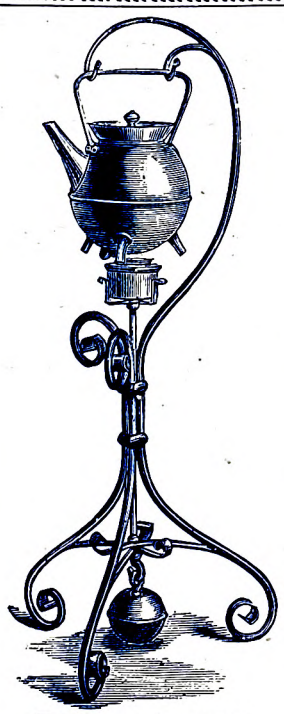


THE "WHITBY."

THE "STANLEY,"

IN POLISHED BRASS AND COPPER.



THE "FIFE."

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AFTERNOON TEA

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IN WROUGHT-IRON,

POLISHED BRASS,

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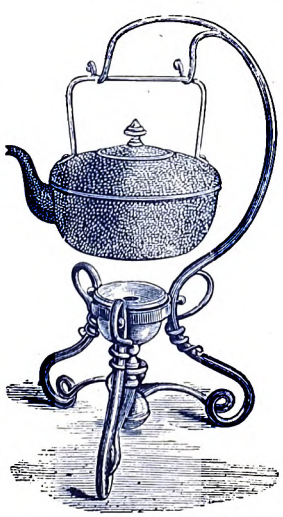
OF VARIOUS DESIGNS AND PRICES.



THE "DWARF ALBANY."

THE "SAFETY."

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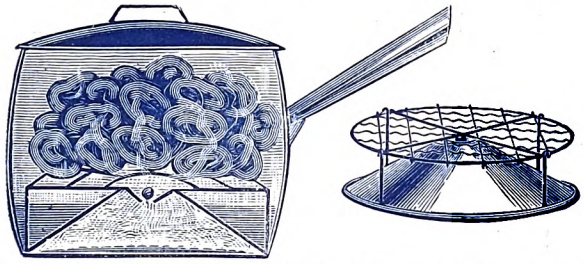
THE

"RAPID" COOKERY STEAMER.

(Patent.)

MADE IN FOUR SIZES.

1/- 1/3 1/6 1/9 each.



VESSELS FITTED WITH THESE STEAMERS IN TIN AND WROUGHT STEEL.

IT COOKS POTATOES—Like Balls of Flour. IT COOKS POULTRY—White & Tender.
IT COOKS FISH—Perfectly. IT COOKS PUDDINGS—Light as a Feather.

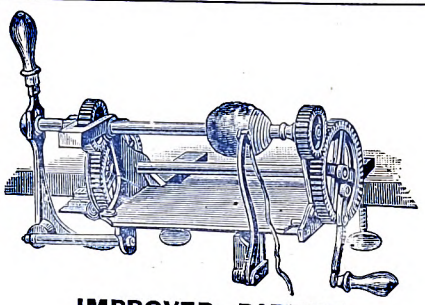
THE DEMON

BEETLE TRAP.

STILL THE ONLY REAL TRAP.

NO IRONMONGER'S STOCK COMPLETE WITHOUT

"THE DEMON."



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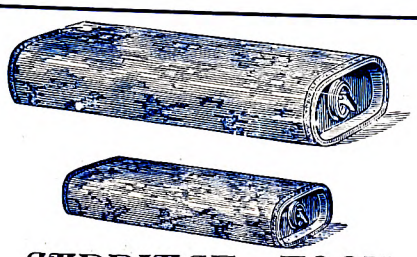
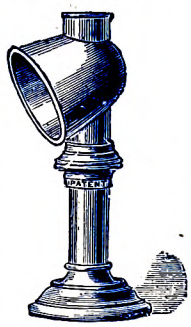
The Most Economical Peeler in the Market.



CARRIAGE FOOT WARMERS,

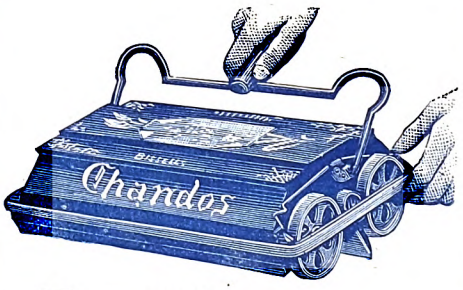
IN COPPER AND TINNED STEEL.



THE

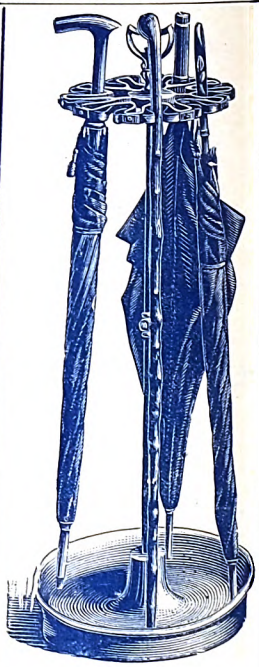
"CAMBRIDGE" READING LAMP.

A VARIETY OF SIZES, BRASS & NICKEL-PLATED.



THE "CHANDOS" CARPET SWEEPER.

Made Specially for B. & F.



THE

UMBRELLIFER,

A VERY HANDY UMBRELLA AND STICK STAND.

THE LARGEST STOCK IN THE KINGDOM

OF

COPPER BRAZIERY GOODS.

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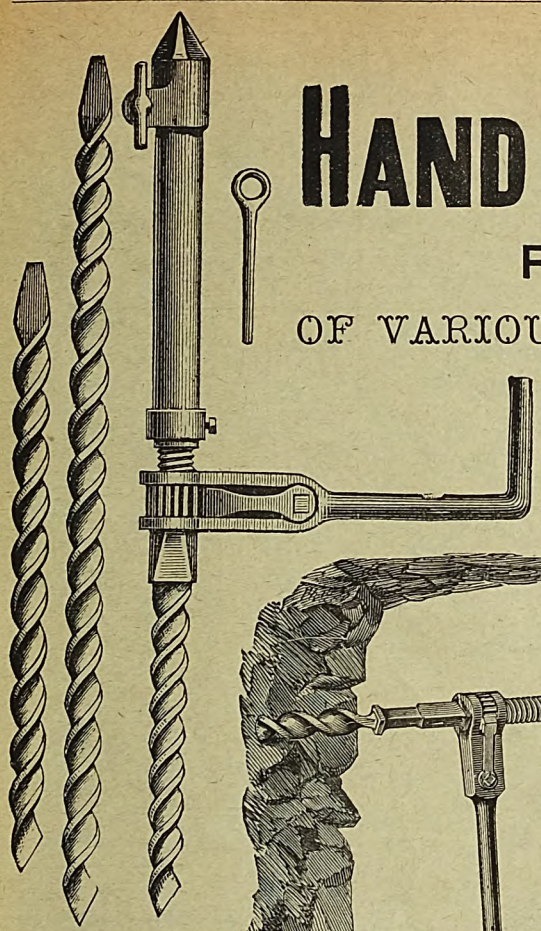
PATENT

HAND BORING MACHINES,

FOR ROCK AND COAL,

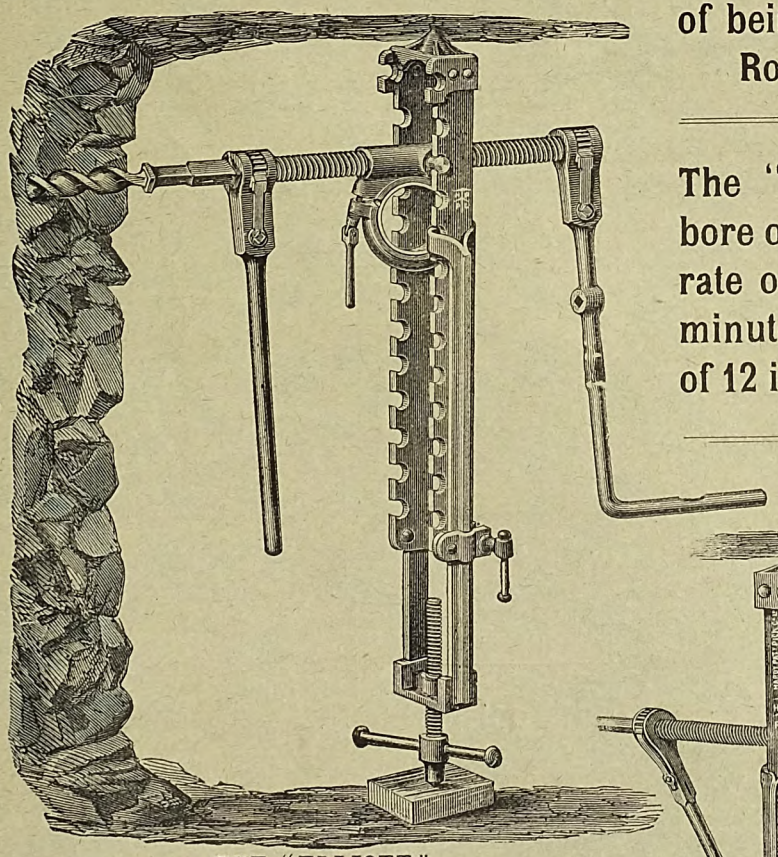
OF VARIOUS PATTERNS, FOR ALL CLASSES OF WORK.



The "RATCHETT," Improved.

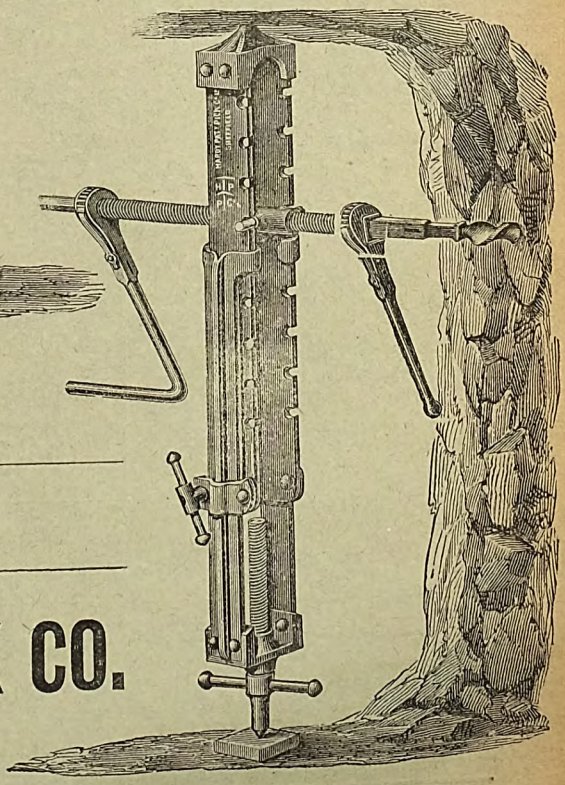
They are Perfect in finish, cheap, light, and compact, and will bore any material capable of being penetrated by a Rotary Steel Drill.

The "Elliott" Drill will bore ordinary Rock at the rate of 1 to 3 inches per minute, or Coal at the rate of 12 inches per minute.



THE "ELLIOTT."

THE "CONQUEROR."



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AND SAVE
TIME,
LABOUR,
AND
MONEY.

They save their cost in a few days.

PRICES:-
From 21s. to £8 10s. each.

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THE HARDY PATENT PICK CO.

(LIMITED,)

Mining Tool Works, **SHEFFIELD.**

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THE HARDY PATENT PICK CO., LIMED,

PATENTEES AND E MAK

"Universal" and "Acme" Solid Steel Contractors' an ining
without the use of Explosives. H Borin

Our Tools are used in every country in the world.

SHOVELS, SPADES, DIGGING AND COKE FORKS, HAMMERS, W

Makers of DOUBLE SHEAR, BLISTER, MINERS

16 PRIZE MEDALS AWARDED FOR EXCELLENC

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D, MINING TOOL WORKS, SHEFFIELD,

MAKERS OF THE

ring Picks, Multiple Wedges for getting Rock and Coal,
oring Machines for Rock and Coal.

And are unequalled for finish, durability, and cheapness.

GES, AND ALL MINING, QUARRY, AND CONTRACTORS' TOOLS.

ILL STEEL, and CAST STEEL for all purposes.

OF QUALITY, FINISH, AND ORIGINAL DESIGNS.

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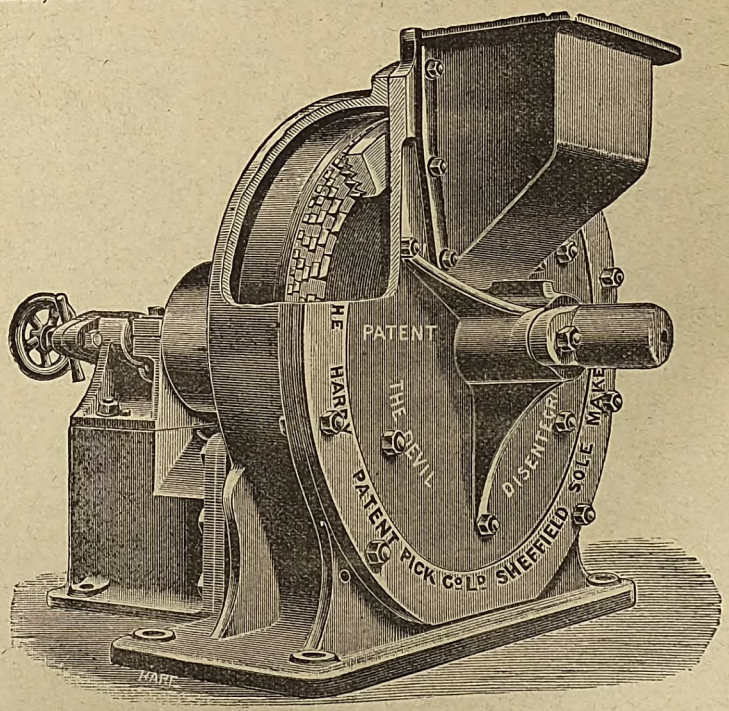
THE "DEVIL" DISINTEGRATOR,

BONE GRINDER AND MIXER,

Is the best Machine of its class, having distanced all other competitors in the **ROYAL AGRICULTURAL SOCIETY'S TRIALS AT PLYMOUTH,** last month. There were 8 entries for this competition.

It will Grind to Powder, Granulate, Pulp, or Shred almost any Material—Animal, Vegetable, or Mineral, Wet or Dry, **AT ONE OPERATION.**

Awarded First Prize and Silver Medal in the Royal Agricultural



Society's Competitive Trials at Plymouth, June, 1890. (8 Entries.)

It is Cheap, Simple in Construction, and not liable to get out of repair. The Grinding Rings, which are the only wearing parts, can be replaced by a labourer, without fitting, at slight cost.

WE CLAIM THE FOLLOWING ADVANTAGES FOR THIS OVER ALL OTHER MACHINES.

1st.—It combines the percussive action with a perfect grinding process, breaking up the material systematically, step by step, until it is reduced to the required degree of fineness, when it is immediately delivered from the machine.

2nd.—It will grind materials, fibrous or non-fibrous, tough or brittle, wet or dry.

3rd.—Clogging is almost impossible, and materials which will clog up most Disintegrators are easily treated by this machine.

4th.—The speed is not excessive, being about one-third that of other Disintegrators, so that it can be driven direct from the fly-wheel of a portable engine, a counter shaft being unnecessary.

5th.—It is easily adjusted, whilst in motion, to suit the sample required.

SOLE MAKERS—

THE HARDY PATENT PICK COMPANY, (LIMITED,)
SHEFFIELD, ENGLAND.

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R. & W. WILSON & SONS,

LIMITED,

Tin Plate Works and Japanners

(WHOLESALE TO THE TRADE ONLY),

84, 90, 92, WARDOUR STREET, & 75, DEAN STREET,

LONDON, W.

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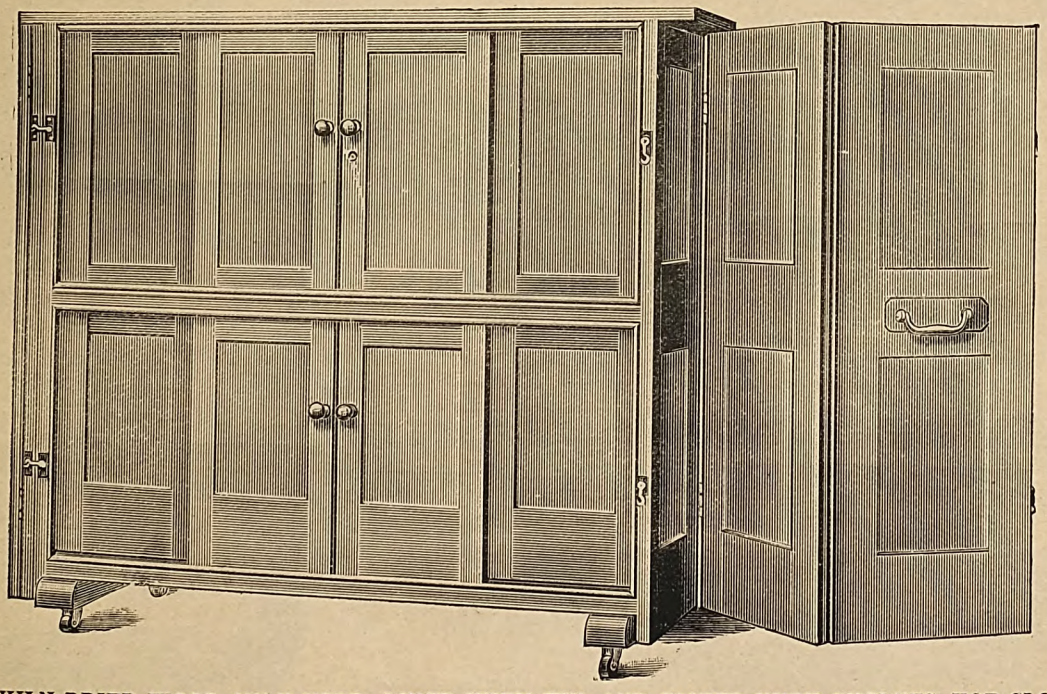
MEAT SCREENS AND PLATE WARMERS

In all sizes and of every description in Stock.



BEST KILN-DRIED WOOD ONLY USED, LINED WITH TIN, AND FITTED WITH SHELVES, HOT CLOSET.

COAL SCOOP SEASON, 1890.

Compare our List with any other maker's, and for equally Good Quality it will be the Lowest.

PLACE YOUR ORDERS EARLY FOR FUTURE DELIVERIES.

R. & W. WILSON & SONS, Ltd., 84, 90, 92, Wardour St., and 75, Dean St., London.

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WILSON'S

SPRAY and PLUNGE BATHS

made to any required Design,

from the CHEAPEST to the MOST LUXURIOUS.

SHOWER BATHS

of all kinds in stock.

WILSON'S

HIGH-CLASS BATHS

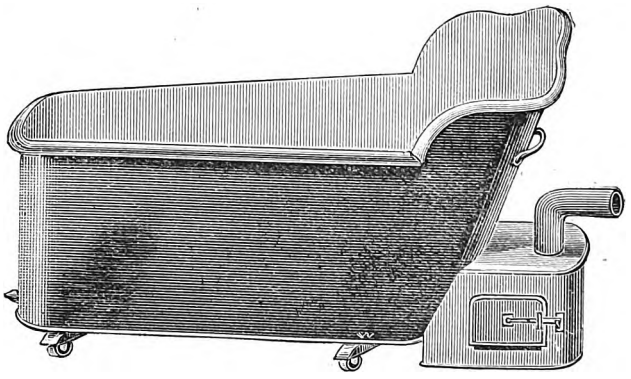
of every description

manufactured and kept in Stock.

JAPANNING on the Premises, in the best manner, at Cheapest Rates.

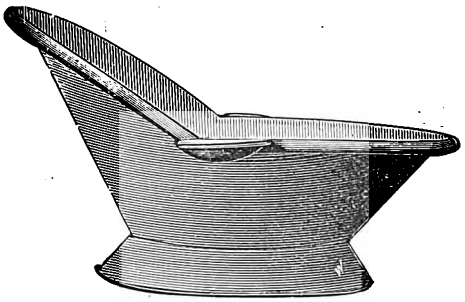
THE TRADE ONLY SUPPLIED.

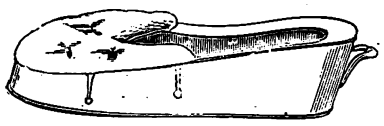
BATHS a Great Speciality for many Years.



WILSON'S UNIVERSAL BATH No. 75,

FITTED WITH FURNACE FOR COAL, COKE, CHARCOAL, &c. MOST USEFUL BATH FOR THE COLONIES, COUNTRY HOUSES, AND UP COUNTRY STATIONS





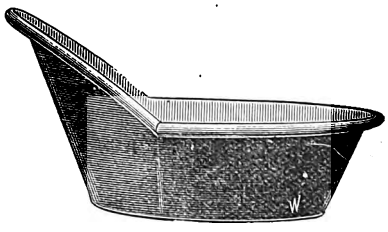
Bed Bath for Ladies' use after Accouchement.

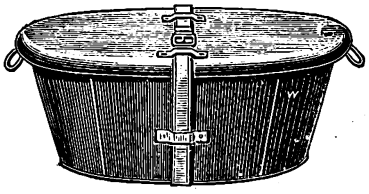
HIP BATHS.

SITZ BATHS.

SPONGE BATHS.

TRAVELLING BATHS.





R. & W. WILSON & SONS, Ltd., 84, 90, 92, Wardour St., and 75, Dean St., London.

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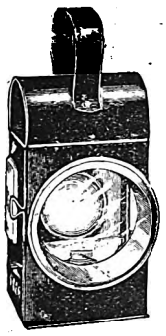
LANTERNS of all kinds in Stock.

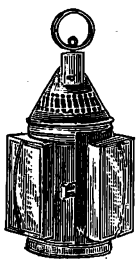


Dashboard.
No. 642.

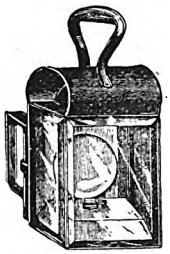
Horn Sides.
615.

Glass.
621.

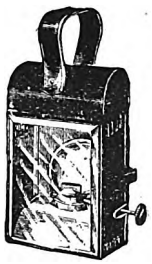
Plate Glass.
628.



Contractor's.
632.



Bevelled Glass.
611.

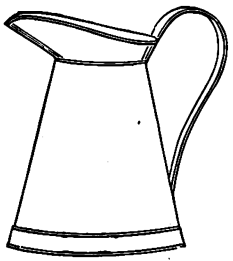


Warehouse.
639.

HOT WATER JUGS in variety of Patterns and Colours.

591.

593.



596.

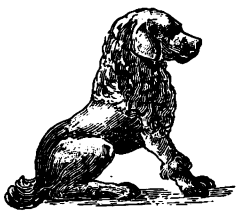
595.

599.

600.

JELLY, PUDDING, BOUCHE, and ENTRÉE MOULDS.

A large assortment on hand at very Low Prices.



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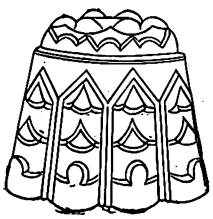

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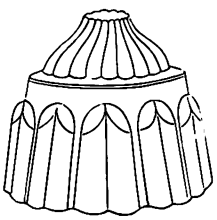

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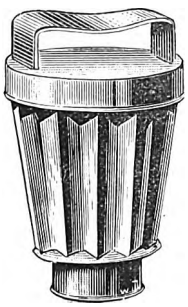
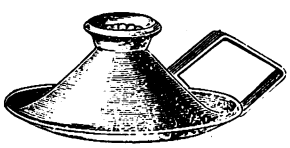


797.

804.



CANDLESTICKS.
Polished Brass
Nickel Plated,
all Newest Shapes.
1305.

WILSON'S MATCH HOLDER.
673.

Milk Saucepans with China Linings
698.

R. & W. WILSON & SONS, Ltd., 84, 90, 92, Wardour St., and 75, Dean St., London.

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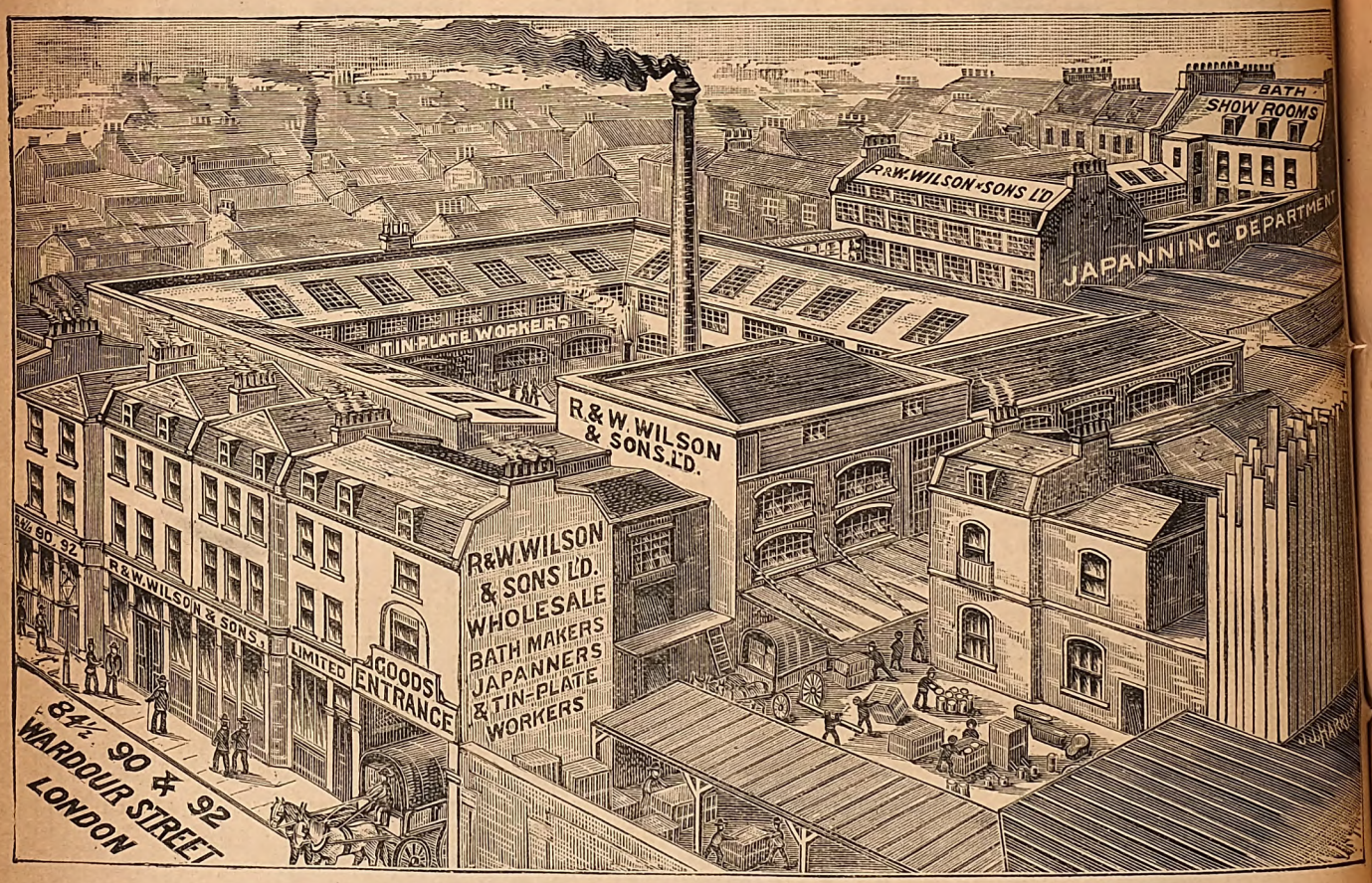
The Premises of R. & W. WILSON & SONS, Ltd., are between Wardour Street and Dean Street, with frontages on both streets. The mansion in Dean Street is historical, and was the abode of Sir James Thornhill, the celebrated painter of St. Paul's Cathedral and Greenwich Hospital. The fine oak staircase, marble floored hall, with the pictures painted on the walls by William Hogarth, are shown to interested Visitors on presentation of Card.



VIEW OF THE PREMISES OF R. & W. WILSON & SONS, LTD., TAKEN FROM THE WARDOUR STREET FRONTAGE.

THE TRADE ONLY SUPPLIED.

R. & W. WILSON & SONS,

LIMITED,

84, 90, 92, WARDOUR STREET, & 75, DEAN STREET,

LONDON, W.

The whole Works fitted up for the manufacture of strong Tin and Japanned Goods, of every description, for all markets.

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NOTICE TO WHOLESALE AND RETAIL IRONMONGERS.

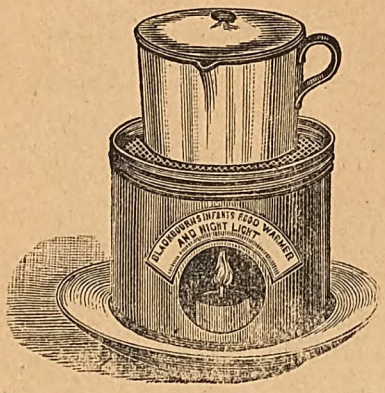
THE

NEW FOOD WARMER.

With Earthenware Pan,

1/9

RETAIL.



With Tin Pan,

1/6

RETAIL.

INFANTS or INVALIDS'

FOOD WARMER.

Requiring an Ordinary Night Light only.

Keeps Milk, Tea, Cocoa, Beef Tea, &c.

UNIFORMLY HOT.

No Soot or Dirt—Pan always Clean.

SIMPLE, SAFE and CHEAP.

PRICE'S CHILDS NIGHT LIGHTS

ANSWER WELL.

Special Terms to the Trade on writing to the Patentee and Proprietor,

HENRY DUNSFORD,

WHOLESALE AND EXPORT DRUGGIST,

82 & 84, DUKE STREET,

LIVERPOOL.

[SEE OTHER SIDE.

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NOTICE TO WHOLESALE AND RETAIL IRONMONGERS.

THE

NEW FOOD WARMER.

With Earthenware Pan,

1/9

RETAIL.

With Tin Pan,

1/6

RETAIL.

INFANTS or INVALIDS'

FOOD WARMER.

Requiring an Ordinary Night Light only.

THE above SIMPLE but SCIENTIFIC appliance has been designed to meet a long felt want, namely:—To have **READY FOR USE** AT ANY HOUR OF THE NIGHT,

WARM FOOD FOR INFANTS OR INVALIDS

TOGETHER WITH A LIGHT, and these advantages at a **SMALL COST** within the reach of all. The dimensions of the above have been so carefully adjusted that a uniform heat and light are maintained during the whole time that the Night Light burns. The Gauze top is so regulated as to keep the Pan perfectly clean. (This advantage will be obvious to all who have to warm Food by the bedside.) Economy has also been considered in utilising the same Night Light for heat and illumination.

The complete apparatus, including Food Pan, is retailed for the sum of - - - - - - - - - - 1/6, Or with Earthenware Pan, 1/9

NOTE.—ANY MAKE OF NIGHT LIGHT usually sold CAN BE USED FOR THIS FOOD WARMER. See "Directions for use" enclosed in each. PRICE'S CHILDS LIGHTS ACT WELL.

WRITE FOR PARTICULARS AND WHOLESALE TERMS FROM THE PATENTEE AND PROPRIETOR,

HENRY DUNSFORD, Wholesale & Export Druggist,

82 & 84, Duke Street, LIVERPOOL.

[SEE OTHER SIDE.

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ASPINALL'S ENAMEL

(REGISTERED AT HOME AND ABROAD).

COLOURS EXQUISITE. SURFACE LIKE PORCELAIN.

HIGHEST AWARD.

PARIS, 1889.

Guaranteed Absolutely Free from the Deadly White Lead.

HIGHEST AWARD.

LONDON, 1885.

REJECT POISONOUS IMITATIONS

Used for the decorations at Sandringham, the Residence of H.R.H. the Prince of Wales, and in Her Majesty's Navy. Also by their Majesties the Empress of Germany, and the Queens of Sweden and Saxony.

Writing on December 22, 1887, a lady says—"Any other that I have used I find cracks or blisters a few days after being put on."

ASPINALL'S ENAMEL

IS THE MOST USEFUL INVENTION OF THE VICTORIAN ERA FOR

Beautifying, Preserving, or Renovating all Art Furniture, Articles of Wicker, Wood, Metal, Glass, China, or Earthenware.
Chairs, Tables, Milking Stools, Baskets, Bedsteads, Baths, or anything INDOORS.
Railings, Gates, Stable, Kennel, and Laundry Fittings, OUTDOORS.

ITS USES ARE LEGION!!

Sold in Tins, 2/6, 1/3, & 5d. each; for Baths, to resist Hot Water, 3-/, 1/6, & 7d. each.

A REDUCTION MADE FOR GALLONS AND HALF-GALLONS.

ASPINALL'S WORK BOX,

Containing 12 Tinlets Assorted Colours, price 5/9 each.

ASPINALL'S ARTIST BOX,

Containing 12 Artist's Tins Assorted Colours, price 2/5 each.

ASPINALL'S EBONICA.

(REGISTERED.)

Specially recommended for Basket Carriages, Cycles, Bedsteads, etc. Jet Black, Brilliant, and Hard as Marble.

ASPINALL'S ENAMEL WORKS,

NEW CROSS, LONDON, S.E.

Also at HOLLYDALE WORKS, PECKHAM, S.E.

Cablegrams—"EDWARD ASPINALL, LONDON."

N.B.—In Writing to us kindly mention this Paper.

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ASPINALL'S ENAMEL

(REGISTERED AT HOME AND ABROAD).

LIST OF COLOURS IN STOCK.

Any Shade, Tint, or Colour made to Pattern.

1 Arab Brown
2 Black
3 Blue
4 Bright Gold 1
5 ,, ,, 2
6 Brilliant Peacock Green
7 Bronze
8 Brown
9 Buttercup
10 Canary
11 Cardinal 1
12 ,, 2
13 Cerise
14 Chalk White
15 Chocolate
16 Coral Pink
17 Citron
18 Cream
19 Crimson
20 Cucumber
21 Dark Blue
22 Dark Oak
23 Dark Red
24 Deep Gobelin 2
25 Deep Fawn
26 Dove's Wing
27 Drab
28 Earth Brown
29 Electric Green
30 ,, Blue
31 ,, Turquise
32 Emerald Green
33 Fawn
34 Fig Green
35 Firefly
36 Flamingo Red
37 Fraise
38 French Grey
39 Gobelin 1
40 ,, 2
41 ,, 3
42 Gold 1
43 ,, 2
44 ,, 3
45 ,, 4
46 Golden Brown
47 Grass Green
48 Green
49 H. S. Egg Tint
50 Heliotrope
51 Holly Green
52 Imperial Red
53 Indian Red
54 Indian Yellow
55 Ivory
56 ,, White
57 Japanese Green
58 ,, Blue
59 Light Brown
60 Light Oak
61 Lilac
62 Mandarin
63 Maroon
64 Moss Green 1
65 ,, 2
66 ,, 3
67 Mouse
68 ,, 1
69 ,, 2
70 ,, 3
71 Myrtle Green
72 Nut Brown
73 Old Gold
74 Olive
75 Orange
76 Pale Blue
77 Pale Primrose
78 Peacock Blue
79 ,, Green
80 Pea Green
81 Pearl
82 Poppy Red
83 Primrose
84 Purple Grey
85 Quaker Blue
86 ,, Green
87 Reseda
88 Rouge Dragon
89 Royal Blue
90 Royal Mail Red
91 Sage Green
92 Salmon Pink 1
93 ,, 2
94 Scarlet
95 Scinde Red
96 Sea Green
97 Sealing Wax Red
98 Shamrock Green
99 Shrimp
100 Silver Grey
101 Sky
102 ,, 1
103 ,, 2
104 ,, 3
105 ,, 4
106 Slate
107 Slate Purple Tint
108 Smoke
109 Starlight Blue
110 Stone
111 Straw
112 Sultan 1
113 ,, 2
114 Terra Cotta
115 ,, 1
116 ,, 2
117 ,, 3
118 ,, 4
119 ,, 5
120 Turquoise
121 ,, Green Tint
122 Vermilion
123 Wedgewood Blue
124 White
125 Willow Green
126 Cream Bath
127 White Bath
128 Flesh Bath
129 Eau De Nil Bath
130 Ivory Bath
131 Sapphire
132 Pink
133 Flesh Colour
134 Apple Green
135 Geranium Scarlet
136 Pompeian Red
137 Apricot
138 Mahogany
139 Autumn Green 1
140 ,, ,, 2
141 Boat Blue
142 Walnut
143 Orange Red
144 Arab Green

STAIN FOR FLOORS—Oak, Mahogany, Ebony, Rosewood, Satinwood, Walnut, and Malachite Green, in Bottles, 1/6 each.

ASPINALL'S METALLIC PAINT, in 9 Tints, Boxes, 1/8 each.

ASPINALL'S ENAMEL WORKS,

NEW CROSS, LONDON, S.E.

Also at HOLLYDALE WORKS, PECKHAM, S.E.

CABLEGRAMS—"EDWARD ASPINALL, LONDON."

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ASPINALL'S ENAMEL

(REGISTERED AT HOME AND ABROAD).

EVERYBODY SHOULD USE

COLOURS EXQUISITE. SURFACE LIKE PORCELAIN.

Lady's World. "Use Aspinall's Black Enamel."

Truth. "Better than any stains for floors."

Art Designer. "Unequalled for beauty."

Le Follet. "Aspinall's charming invention."

Bazaar. "The best paint for Baths is Aspinall's Snow White Bath Enamel."

Globe, Oct. 3, '87. "I lately saw a very shabby set of blistered painted bedroom furniture turned into a handsome suite of pale blue with Aspinall's Enamel."

Globe. "Aspinall's Wonderful Enamel."

Housewife. "Use Aspinall's Flamingo Enamel."

Cheltenham Examiner. "Wonderful gloss and finish."

Pictorial World. "Use Aspinall's Enamel for Baths."

FOR HOUSE DECORATION.

Beware of numerous, cheap, and worthless imitations that unscrupulous shopkeepers endeavour to foist upon the public. They will crack, chip, fade, blister, and only cause annoyance and vexation.

ASPINALL'S ENAMEL is the only real ENAMEL!

ASPINALL'S ENAMEL DOES NOT DRY TOO QUICKLY;

THOSE THAT DO WILL NOT WEAR.

For Renovating and Beautifying Chairs, Tables, Brackets, Glass, China, Earthenware, Iron, Doors, Dados, Panels, Stables, Garden Seats, Summer Houses, etc., etc.

USED BY BOTH HIGH AND LOW, RICH AND POOR.

REJECT IMITATIONS.

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FIRST PRIZE MEDAL. HIGHEST AWARD POSSIBLE, PARIS, 1889.

SUBJOINED ARE A FEW OF NUMEROUS TESTIMONIALS OF THIS ENAMEL. ALL THE ORIGINALS CAN BE SEEN AT THE WORKS.

AS USED AT WINDSOR CASTLE AND SANDRINGHAM, AND BY ALL THE ÉLITE.

"HER MAJESTY THE QUEEN OF SWEDEN AND NORWAY has used your 'Enamel Paints' with great success, and has expressed satisfaction. Please send enclosed order direct to Her Majesty at Stockholm. (Signed) "OTTO CRONSTENT, *Chamberlain in Waiting.*"
"Craghead, *June 7th*, 1888.

ASPINALL'S

ENAMEL

The MARCHIONESS OF SALISBURY says: "The Enamel I ordered from you answers very well."

The COUNTESS OF LOUDON says: "I am much pleased with the Enamel Paint. It is very satisfactory."

The COUNTESS OF NORBURY says: "I have lately used your Snow White Enamel Paint, and have been thoroughly satisfied with my experience of it."

The COUNTESS FERRERS says: "I have found your Enamel Paint excellent for decorating wicker work and wooden articles. I have recommended it to Lady Burdett."

VISCOUNTESS CLIFDEN says: "Your Enamel Paints are very satisfactory. I shall feel obliged if you will send me . . ."

LADY MACGREGOR says: "I have much pleasure in highly recommending your Enamel Paints. The colours are beautiful, and a great convenience is that the paint dries so quickly."

LADY GRANTHAM says: "I have much pleasure in recommending your White Bath Enamel which I have used with great success for several baths."

The College, Maidstone, Feb. 4, 1889. Mr. Aspinall, Dear Sir,—I must write and give my opinion of your Enamel Paint, which I have used with the greatest satisfaction for a long time. It was not until the other day that I really found out its admirable qualities. Being attracted by the announcement of an Enamel which was to dry in five minutes, I was induced to try it. Although I have used three tins on a screen exactly the same size as one which I enamelled with one and a half tin of yours, I find the work most unsatisfactory, and I shall have to have it varnished. You are quite at liberty to use this if it is of any use to you. Yours faithfully, FRED M. CUTBUSH

LADY BUXTON says: "I have much pleasure in recommending Mr. Aspinall's Enamel. I have used it in several different colours for wooden furniture, tin cans, glass and china ornaments, with equal success. The Bath Enamel is also perfectly satisfactory."

CONTRACTORS TO HER MAJESTY'S GOVERNMENT.

For Inside and Outside Work. Ready for use in 150 Colours. For Art Furniture, Japanese Tables, Wicker and Basket Ware, Milking Stools, Bedsteads, Brackets, Chairs, etc., etc.

ORDINARY ENAMEL.

PRICE—In Tinlets, 5d.; post free, 7d. In Tins, 1/3 and 2/6; post free, 1/6 and 3/-. In Bijou Boxes, containing 3 colours, 1/3; post free, 1/6. In Gallon Cans, etc., 20/- per Gallon, Can and Brush included, carriage paid. Black, Maroon, Dark Oak, Arab Brown, & Chocolate, 16/- per Gallon, Can and Brush included, carriage paid.

BATH ENAMEL.

PRICE—In Tinlets, 7d.; post free, 9d. In Tins, 1/6 and 3/-; post free, 1/9 and 3/6. In Gallon Cans, etc., 25/- per Gallon, Can and Brush included, carriage paid.

WORKS—NEW CROSS, LONDON, S.E.

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THE GREAT OR COUNCIL MEDAL. LONDON. 1851.

SPECIAL GOLD MEDAL. MELBOURNE 1880.

GOLD MEDAL OF HONOUR. PARIS. 1855.

FIRST AWARD. SYDNEY. N.S.W. 1879.

SPEAR & JACKSON,

REGISTERED TRADE MARK. S J

ÆTNA WORKS, Sheffield

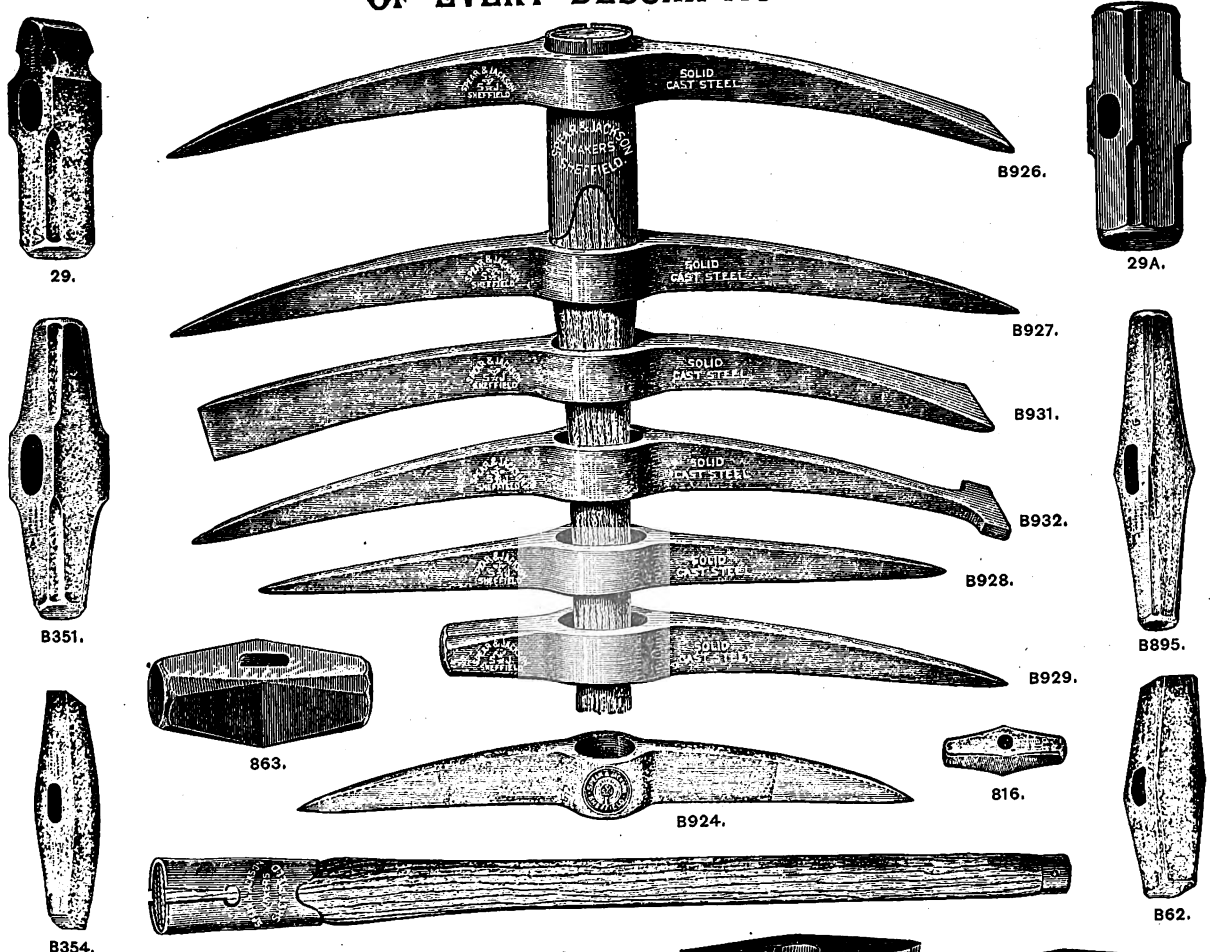
REGISTERED CORPORATE MARK. ÆTNA

Address for Telegrams, "SPEAR, SHEFFIELD"

MANUFACTURERS, BY IMPROVED MACHINERY, OF

MINING, QUARRY, PLATELAYERS' etc., TOOLS,

OF EVERY DESCRIPTION.



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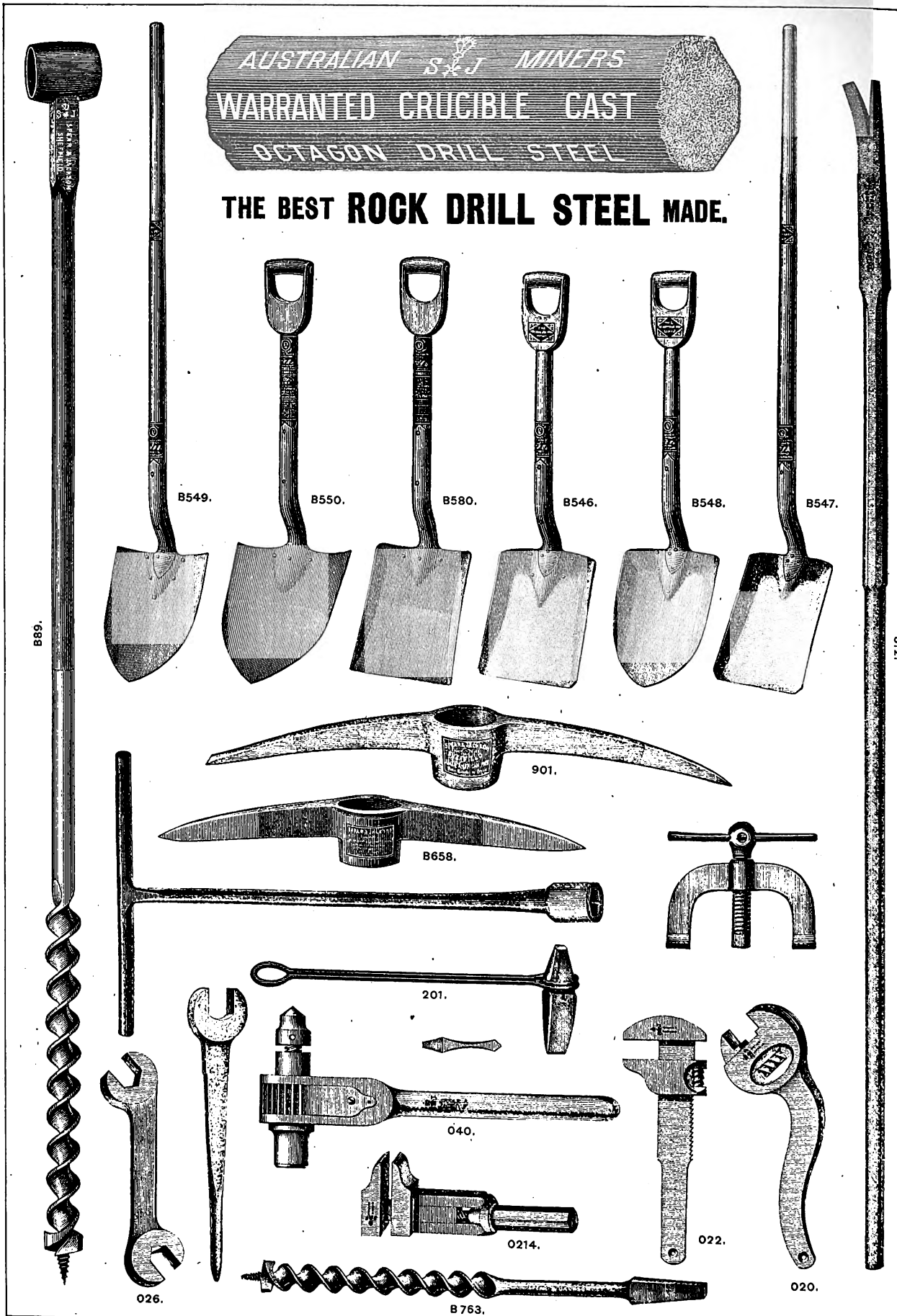

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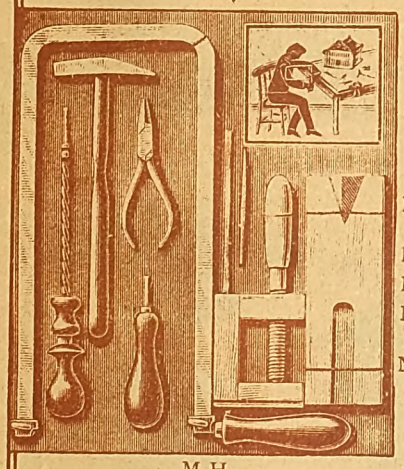
HARGER BROS., Settle, Yorks.

HIGHEST AWARD.

MANUFACTURERS FRETWORK

& IMPORTERS OF MATERIALS.



M.H.

CARDED OUTFITS.

Containing No. M. H., as drawing, 23/9 per doz.

No. 12N.—12 inch Best Buhl Saw Frame, assortment of best Saws, Handled Files, Gimlet, Brad Awl, Screw nosed Archimedian Drill and 6 Bits, and New Cramp and Sawing Table, Table Vice, designs, &c. This is the most successful outfit yet introduced. ... ... } 30/- dozen.

No. 0.—12 in. Buhl Saw Frame, Brad Awl, assortment of Saws and Files, Designs, &c. ... ... } 9/4 dozen.

No. OD.—Ditto ditto ditto and Archimedian Drill ... ... 11/2 dozen.

No. ODN.—Ditto ditto ditto and New Pattern Cramp and Sawing Table 17/6 dozen.

No. 994.—12 inch Best Saw Frame, Brad Awl, better assortment of Saws and Files, Screw Cramp, Designs, &c. ... ... } 20/7 dozen.

No. 995.—Ditto ditto ditto and Strong Archimedian Drill ... 24/6 dozen.

BUHL SAW FRAMES.

No. 353.—Ordinary Pattern, 12 inch ... ... 5/- dozen.

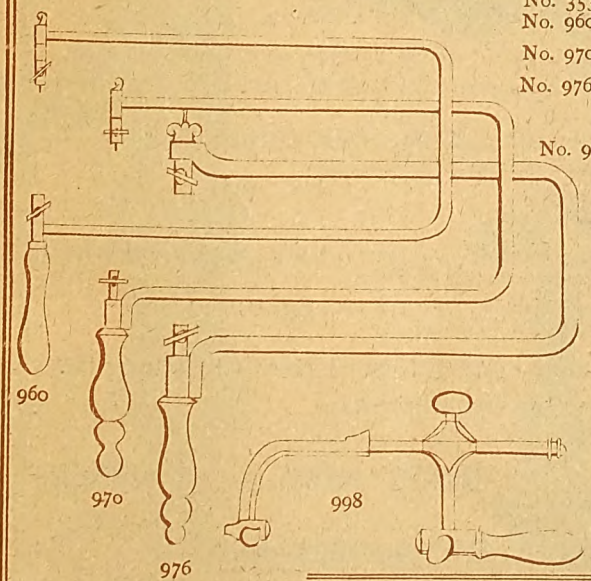
No. 960.—Ditto Better Quality ... ... 6/9 ,,

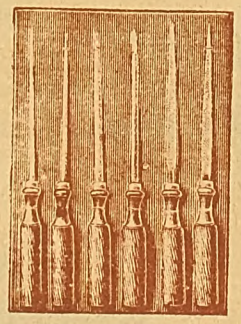
No. 970.—Ditto Best Quality, Turning Handle 12 14 16 18 in.
11/6 12/6 17/- 20/- doz.

No. 976.—Fine Flat Mahogany Turning Handle, and Top Screw, giving Double Tightening Power ... 12 in. 8/- doz. increasing 6d. each size.

No. 976A.—Fine Oval Steel do. do. and Fine Polished 21/- doz.

No. 978.—Sliding Piercing Saw Frames, 10/- per dozen.





FRETWORKERS NEEDLE FILES.

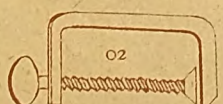
Assorted, 6 Patterns.

4 in	4⅝ in. long.
4/6	5/6 doz. cards of 5 assorted.
4/9	5/9 doz. cards of 6 assorted.
7/6	9/0 per gross, Files, assorted, loose in parcels.

Buhl Files, Handled as drawing, 2/6 per doz.

BRIGHT BUHL CRAMPS,

3 in. 5/6 per. doz. 4 in. 6/6 per doz. Japanned Cramps, 2½ in. 3/6 per doz.



BUHL SAWS.

No. 1	2nd quality	10d. per gross.	Sizes, 00 to 6.
,, 3	Best Round Back	1/5 ,,	
,, 5	Best Griffins or Star Saws	3/3 ,,	

Trade Discount on Application.

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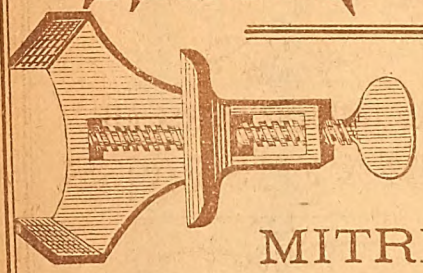
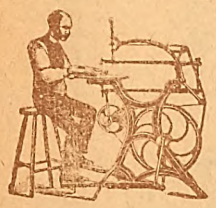


No. 60.—BEST ENGLISH CORNER CRAMPS FOR PICTURE FRAMES.

	Nos. 1	2	3
Will take Mouldings	1¾ in.	3 in	4 in. wide.
Price per Pair	1/6	2/3	3/9

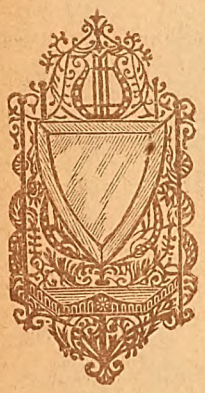
MITRE CUTTING MACHINES.

No. 1.—Complete to cut 2 in. Mouldings	11/3
No. 2.—Ditto to cut 4 in. do.	22/6



FRETWORK TREADLE MACHINES.

The "Rogers," complete, No. 1	16/6.
The "Cricket," ,, ...	13/-
The "Lester," ,, ...	48/-
The "Companion" Lathe and Saw	40/-
The "Rival," with Drill	46/-



FRETWORK DRILLS.

No. 1980.—Drill Stock, Brass Handle ...	3/6	per dozen.
No. 1981.— Do. Superior, and Wood Handle, with 6 bits	7/6	,,
Buhl Turn Screws, with Polished Black Handles	1/-	,,
Do. do. all steel	-/6	,,

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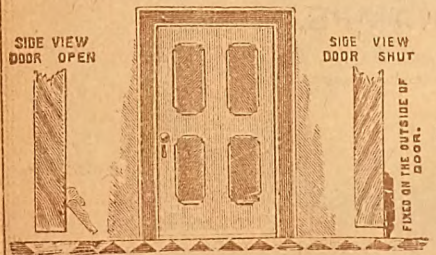

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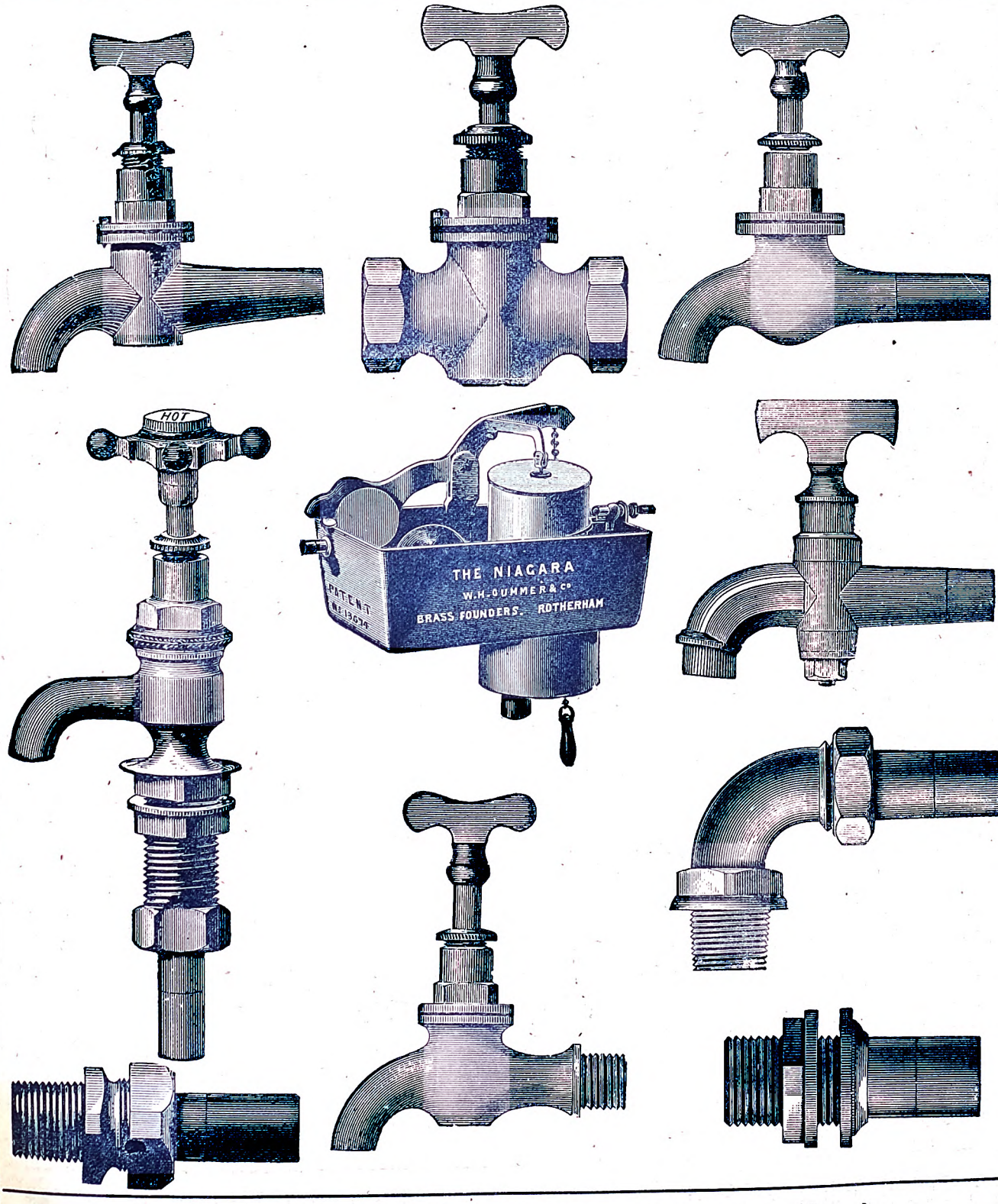

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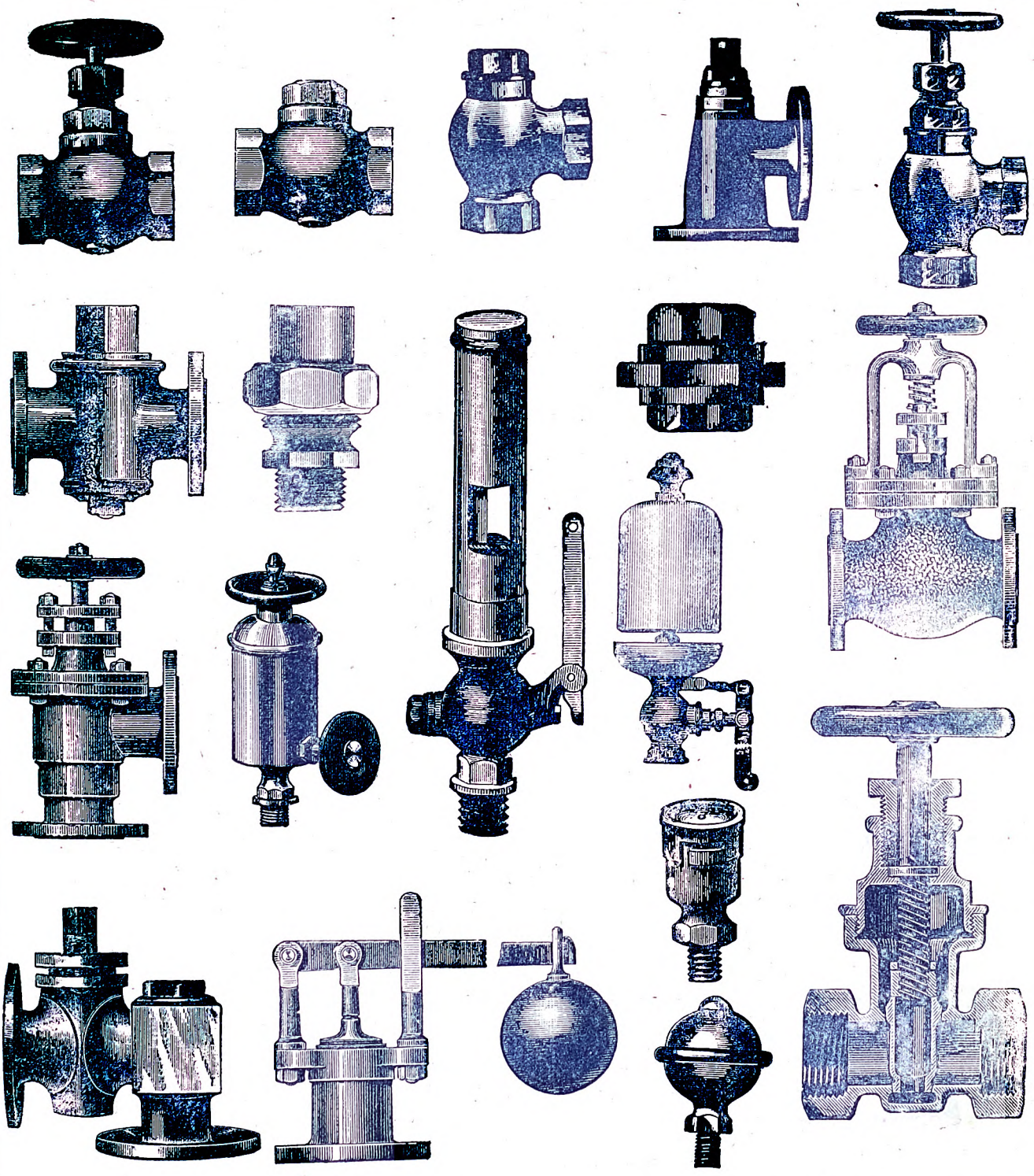

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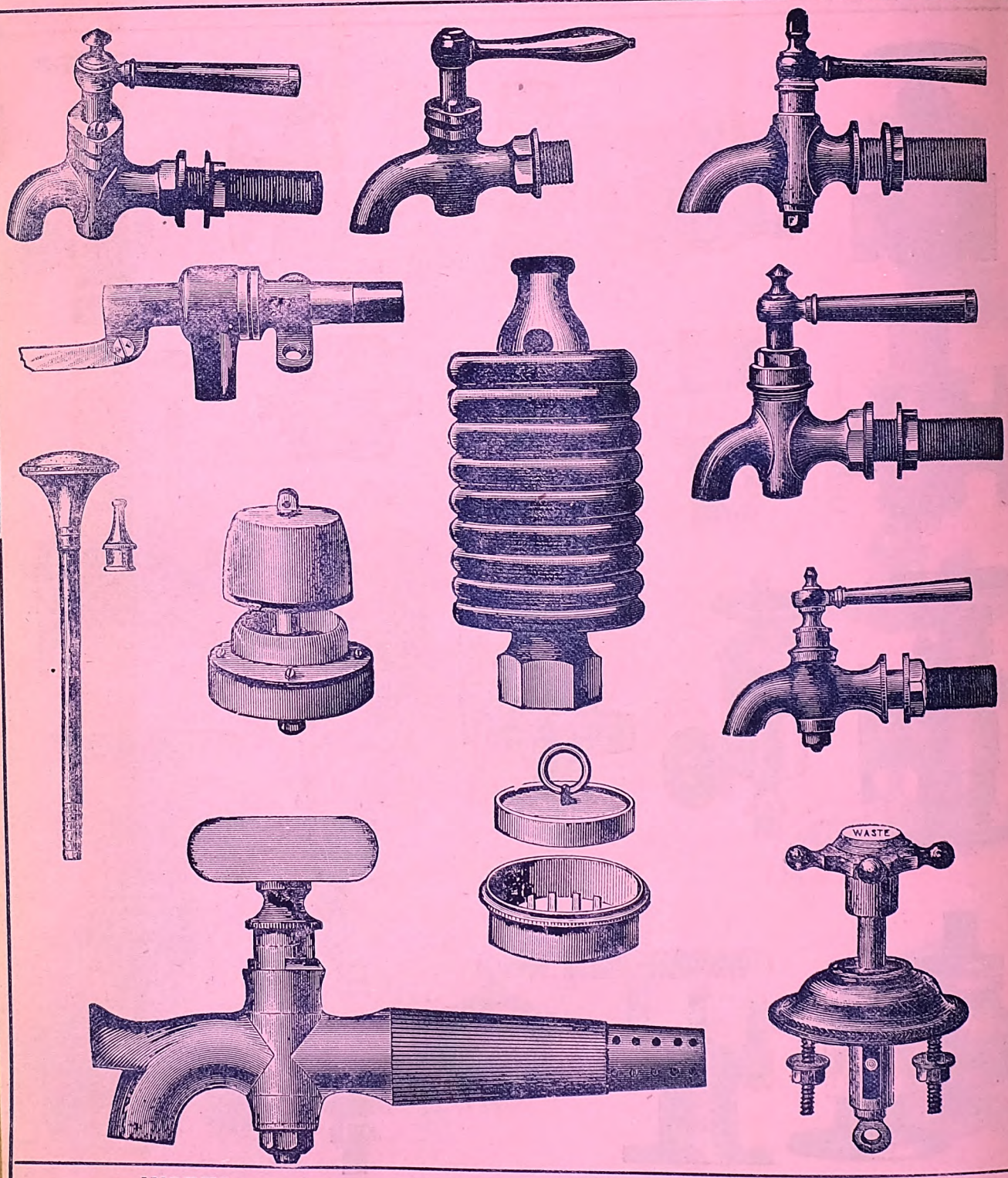

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AT
PLYMOUTH GREAT TRIALS, 1890
In competition with all the leading Makers.

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Held at NEWPORT, 1890.

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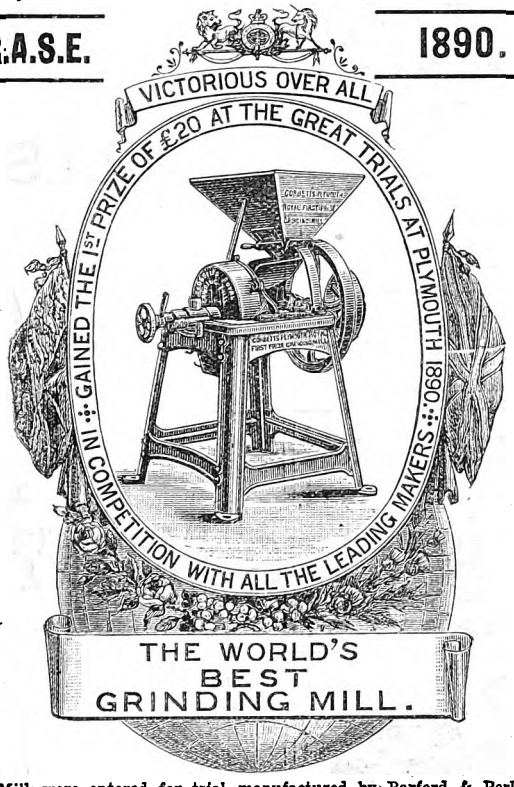

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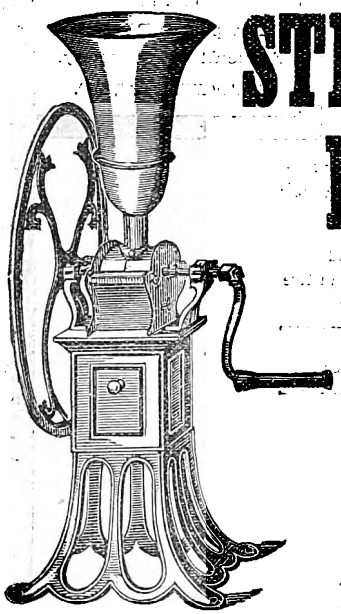

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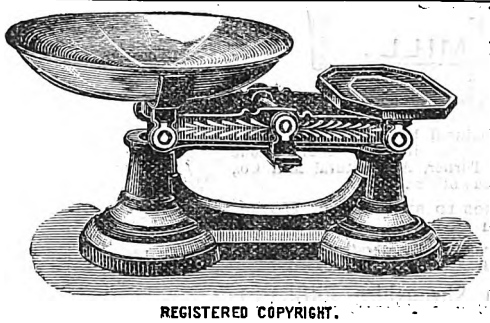

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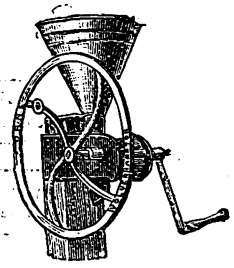
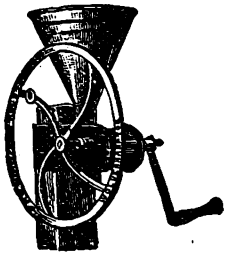
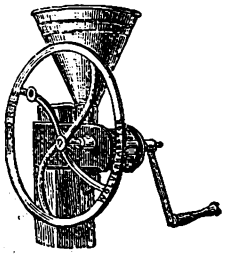
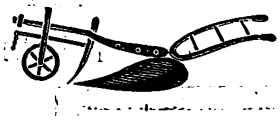


MILLS MADE BY



NEW PATENTED MACHINERY



TRADE  MARK.

W. CORNS & SON,

WOLVERHAMPTON.

WRITE FOR PRICES & PARTICULARS.

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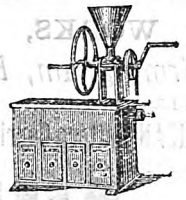
ST. JAMES'S SQUARE, WOLVERHAMPTON.

Telegraphic Address—"PURSHOUSE WOLVERHAMPTON."

ESTABLISHED IN 1800.

No. 30.

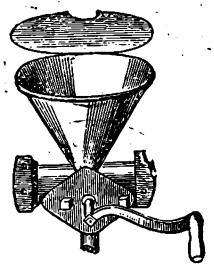
No. 20.



Flour Mill, 128.

No. 133.

No. 12.



No. 21.

Mills to work by hand or power for grinding Coffee, Pepper, Cocoa, Indian Corn, Malt, Oats, Beans, Peas, Barley, Wheat, Rice, Almonds, Cochineal, Indigo, Liquid Paint, Maize, Mealies, and Seeds of all kinds; Malt and Oat Crushers, Bean Splitters, and Kibbling Mills.

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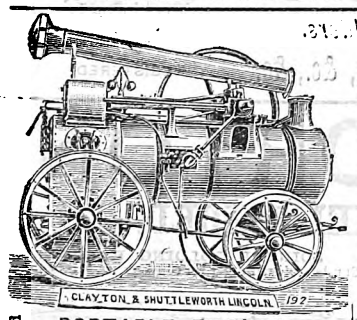

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THRASHING MACHINES
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CHAFF CUTTERS
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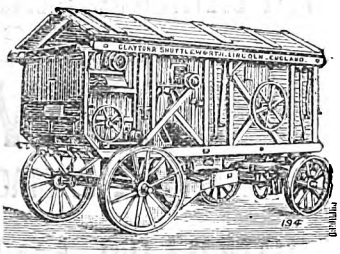

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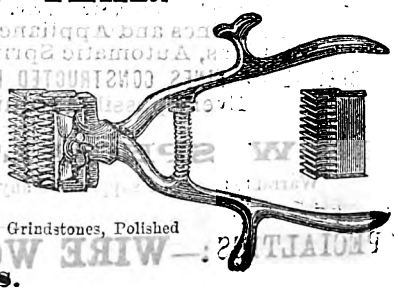

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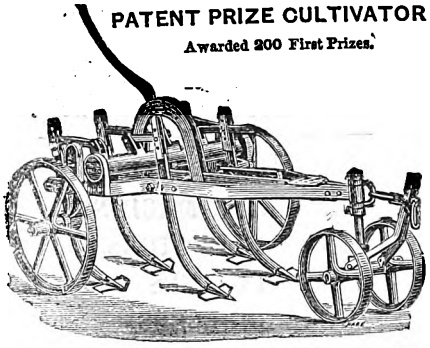

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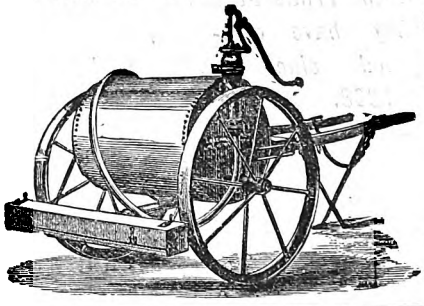

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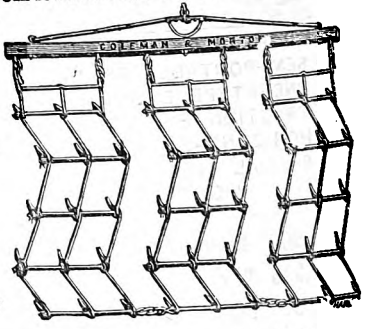

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PROTECTED BY

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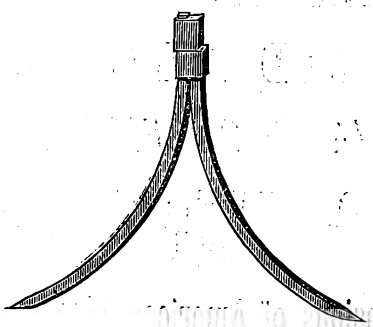

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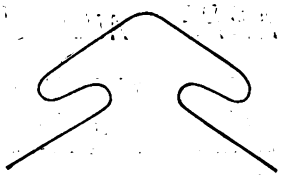
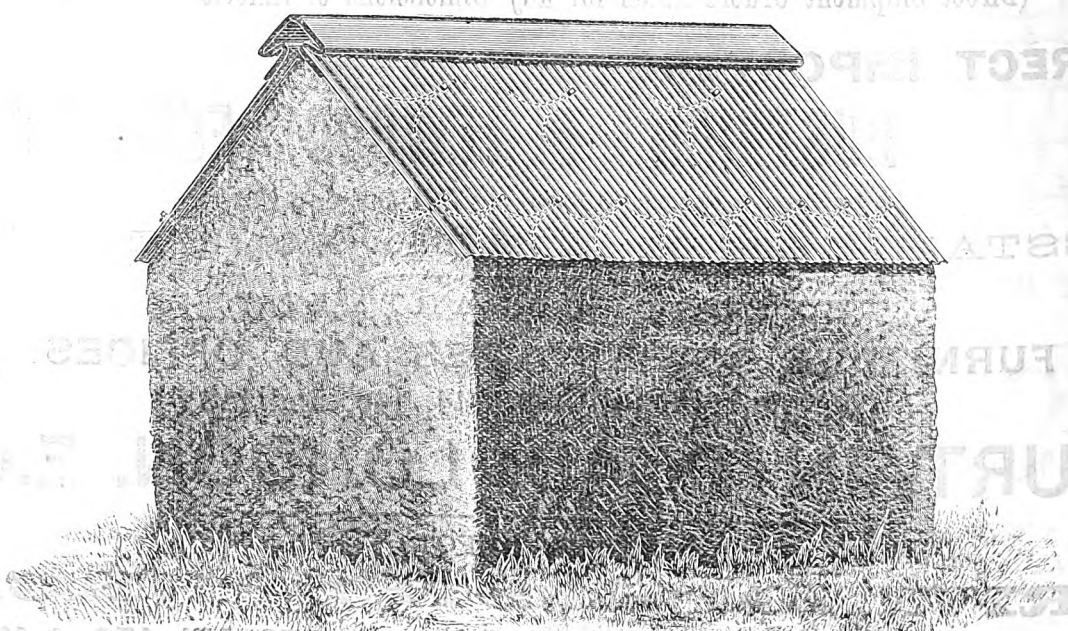
SELF-ADJUSTING RIDGE CAP.





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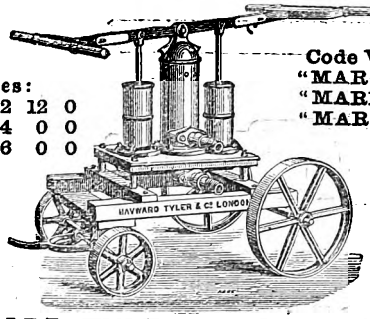

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[11]

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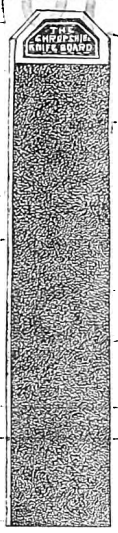

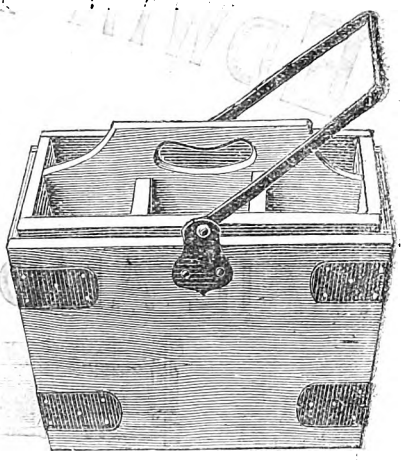

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OF BEST QUALITY.

THE STOCKTON HEATH FORGE CO.

WARRINGTON.

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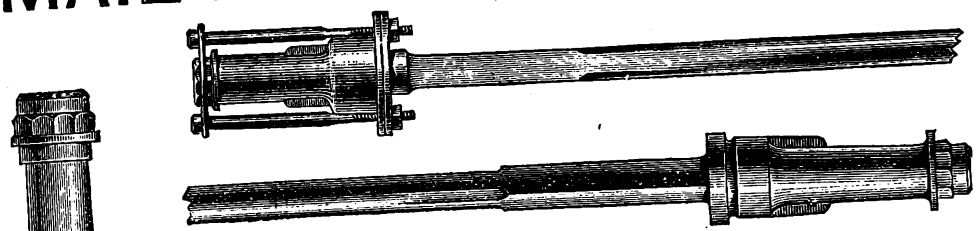
EDWIN RICHARDS & SON,

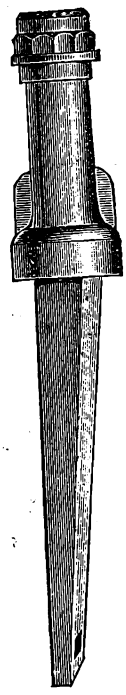
TRADE MARK.

PORTWAY.

MANUFACTURERS OF

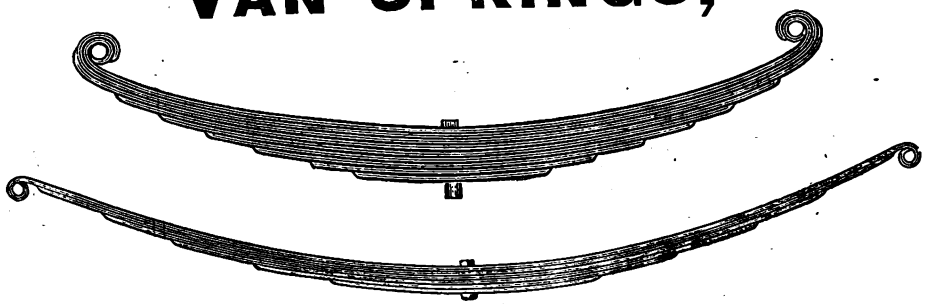
MAIL AND COLLINGE'S AXLES.

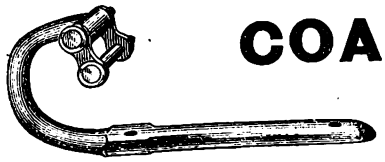




DRABBLES & CART ARMS.

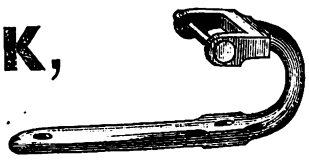
CARRIAGE AND VAN SPRINGS,





COACH IRONWORK,

&c. &c.



PORTWAY WORKS, WEDNESBURY,

STAFFORDSHIRE.

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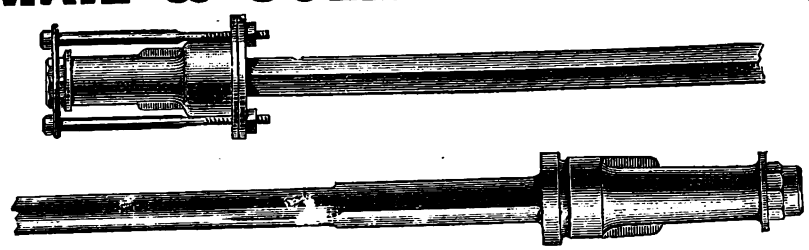
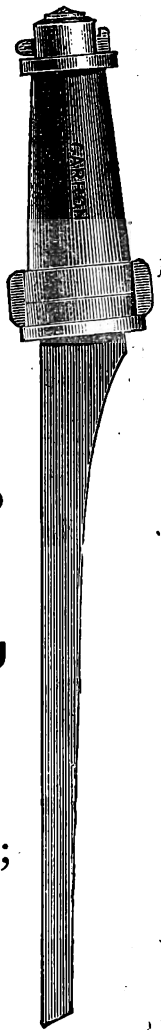
JOHN RIGBY & SONS,

ESTABLISHED 1842.

MANUFACTURERS OF

MAIL & COLLINGE'S AXLES,





Australian Wagon & Cart Arms,

DRABBLE'S PATENT VAN ARMS,

CAPE WAGON ARMS & AXLES

NATAL BRAKES AND CAPE WAGON JACKS,

COACH, CART, AND BUGGY SPRINGS,

COACH IRONWORK, ETC.

HIGHEST POSSIBLE AWARDS GIVEN TO THE ABOVE:

SYDNEY, 1879; MELBOURNE, 1880 & 1881;

ADELAIDE, 1887; MELBOURNE, 1888.

WEDNESBURY, STAFFORDSHIRE.

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MARSDEN BROTHERS & CO.,

MANUFACTURERS OF

TRADE MARK.

EDGE AND JOINERS' TOOLS,

Garden Shears, Horticultural Tools, Pen, Pocket and Table Cutlery, Razors, Scissors, &c.;

SKATE MANUFACTURERS

(By Special Appointment) to Her Majesty and the Royal Family.

BRIDGE STREET WORKS, SHEFFIELD.

GEO. THORNTON & CO., EDGE TOOL MANUFACTURERS.

Phœnix Works, Wharf Street, Aston Manor, BIRMINGHAM,

SOLE MAKERS OF THE RENOWNED

TRADE MARK. MARK.

G. T. & CO.

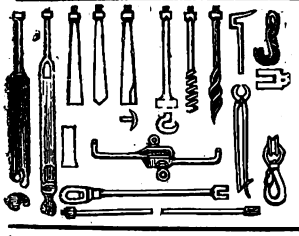
PHŒNIX & KODALLIE BRAND HOES.

MAKERS OF ALL KINDS OF

PLANTATION HOES, DIGGERS, &c., PICKS, SHOVELS, SPADES, HAY, MANURE, POTATO, DIGGING, and all other FORKS, ADZES, AXES.

CONTRACTORS TO HER MAJESTY'S GOVERNMENT.

"INDIA" or "PHŒNIX" HOE



PUMPS & WELL-BORING TOOLS.

Manufacturers of every description of Pumps, Well-Boring Tools and Pipes, Hydraulic and Screw Jacks, Crabs, Cranes, Overhead Travellers. Pulley Blocks, Galvanized Tanks and Pails.

EVERY DESCRIPTION OF CONTRACTORS' PLANT, &c., BORING TOOLS AND PUMPS, OF ANY SIZE OR DEPTH, FOR HIRE.

R. RICHARDS & CO., 2 UPPER GROUND ST., LONDON, S.E.

J. J. CORDES & CO., LIM.

Dos Works, Newport, Monmouthshire,

Manufacturers of the

PATENT WROUGHT (EWBANK'S) NAILS.

TRADE MARK

STEEL NAILS.

TRADE MARK.

CUT and WIRE NAILS.

MANUFACTURERS OF SLIT NAIL RODS.

AGENTS FOR LONDON AND THE HOME COUNTIES,

JOHN GEORGE & SONS, NAIL MERCHANTS AND FACTORS, 18 Great Alie St., LONDON, E.

Where a Large Stock is always kept.

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FIRST CLASS AWARD, MELBOURNE EXHIBITION, 1889.

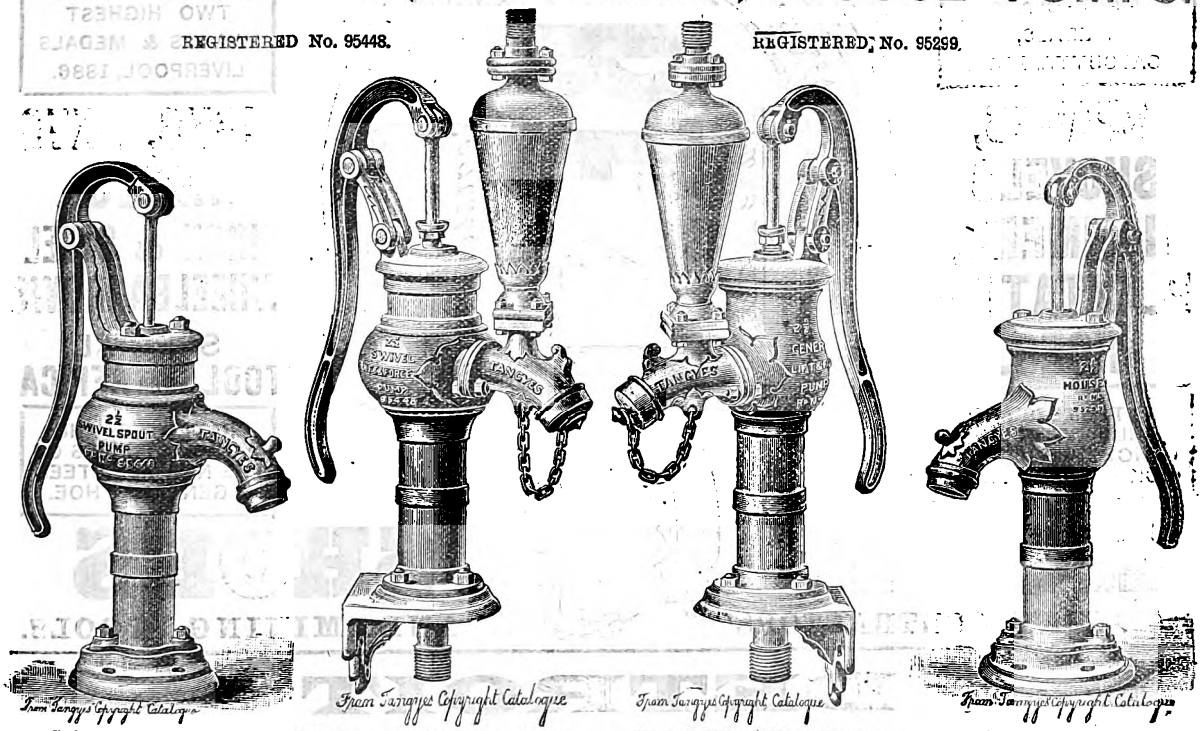
TANGYES LIMITED,

CORNWALL WORKS, BIRMINGHAM.

LONDON: 35 QUEEN VICTORIA ST., E.C. MANCHESTER: DEANSGATE. SYDNEY: HAY STREET.
NEWCASTLE: ST. NICHOLAS BUILDINGS. GLASGOW: ARGYLE STREET. MELBOURNE: COLLINS STREET WEST.

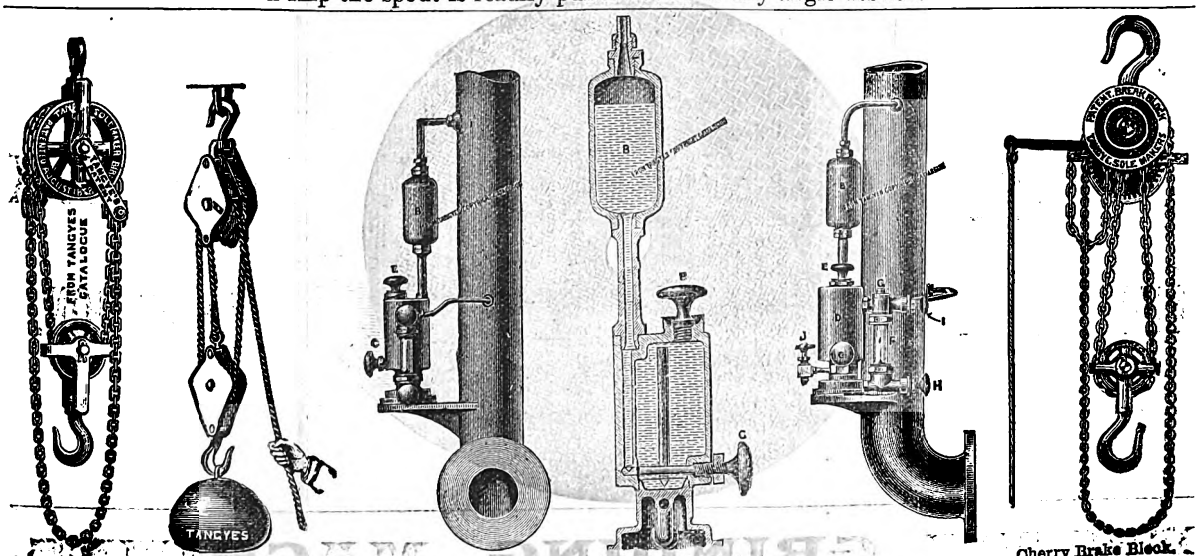
NEW DESIGN (REGISTERED) HOUSE PUMPS.

REGISTERED No. 95448. REGISTERED No. 95299.



Swivel Spout Pump. Swivel Spout Lift and Force Pump. General Lift and Force Pump. House Pump.

The above illustrations are taken from photos of four of the new series of Hand Pumps being introduced by Tangyes Limited to replace the old and ugly style of House Pump in general use. They combine whatever is useful in the latter with gracefulness of design, and the price remains the same. In the Swivel Spout Pump the spout is readily pulled round to any angle desired.



Chain and Rope Pulley Blocks. Improved Sight-feed Lubricator Cherry Brake Block.

Makers of Steam Engines, Boilers, Pumps, Cranes, &c., &c.; Hydraulic Presses, Cranes, Pumps, Jacks, Punches, Shears, &c., &c. Screw Jacks, Rail Benders, Jim Crows, Steam Valves and Cocks, Ratchet Braces, Stocks and Dies, &c., &c.

PRICE LISTS ON APPLICATION.

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WILLIAM EDWARDS & SON,

WOLVERHAMPTON, 5 & 6 Suffolk House, Cannon St., London, E.C.

EDGE TOOLS

FIRST-CLASS MEDALS, CALCUTTA, 1884.

TWO HIGHEST AWARDS & MEDALS LIVERPOOL, 1886.

THE ORIGINAL AND ONLY MAKERS OF THIS BRAND

BEST

Trade Mark. *Registered*

SPADES, SHOVELS HAMMERS, PLANTATION HOES.

PICKS, AXES ADZES, IRON & STEEL WHEELBARROWS

SPECIAL TOOLS FOR AFRICA.

PATENTEES AND MANUFACTURERS OF PUNCHED SOLID EYE PICK AXES, HOES &C.

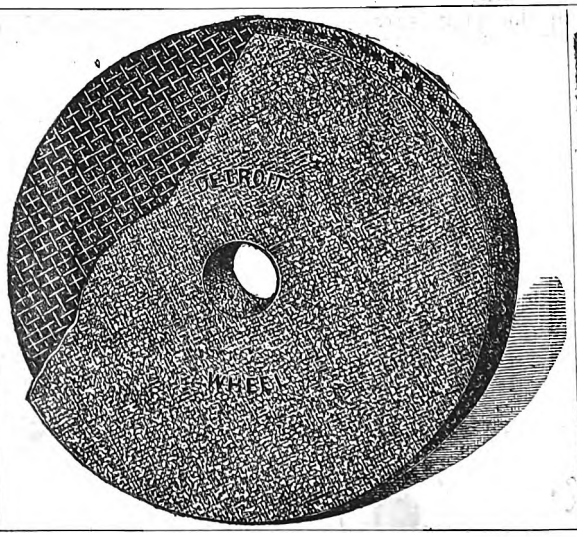
PATENTEES AND MANUFACTURERS OF THE NEW ALL STEEL "GENERAL" HOE.

HORSE SHOES

RAILWAY CONTRACTORS' AND MINING TOOLS.

DETROIT EMERY AND CORUNDUM WHEELS.

75,000 SOLD LAST YEAR.



LARGE STOCK IN LONDON.

EMERY GRINDING MACHINES.

BAGSHAWE BROS. & CO., 4a Upper Thames St., LONDON, E.C.

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TREGGON & CO.

(THE OLDEST FIRM IN THE TRADE.)

Perforated Zinc
Sash Bars and Roll Caps
Bell Tubing
Wire Netting
Perforated & Plain Tin Plates
Black and Galvanized Iron Sheets
Tinned and Terne Iron Sheets
Soft Steel Sheets
Perforated Copper and Brass
Corrugated Iron
Filter Bottoms
Buckets, Bowls, and Foot-Baths
Stamped Friezes
Coal Scoops & Watering Pots
Fencing and Strand Wire
Furnace Pans and Fittings
Builders' Screens and Sieves
Corn, Flour, and Dust Bins
"New" Basins
Zinc and Iron Baths
Hot-Water Cylinders
Oil Tanks, Cans, and Casks
Water-waste Preventers
Ball Valves and Water Balls
Best Foreign Sheet Zinc
Pulley Blocks and Hoists
Best Solder
Zinc Rod
Pure Block Tin
Garden Arches and Stakes
"Water-witch" Garden Engine
Bicycle and Tricycle Houses
Cattle and other Troughs
Iron Pumps
Water and Wheel Barrows
Zinc Roofing
Radiating Heat Generators
Archimedean and other Ventilators
Meat Safes
Barbed Wire Fencing
Chimney Tops and Cowls
Zinc and Iron Nails
Speaking Pipes and Fittings
Astragals
Frets and Friezes
Hose Reels
Iron Mats
Cast Iron Gutters and Pipes
Zinc and Iron Ridging
Wrought Iron Gutters and Pipes
Ornamental Zinc Work
Iron Wine Bins and Cask Stands
Weather Vanes
Poultry Fencing
Verandahs
Stove Pipes and Elbows
Stamped Zinc Work
Garden Labels
Travelling Trunks
Zinc Dormers and Zinc Tiles
Roofing and other Felts
Fire Guards
Welded Tubes
Wire Lattice
Iron Tanks and Cisterns
Zinc Gutters and Pipes
Cast Air-bricks
Hand-Glass Frames
Wire Nails
Waterproof Lining
"Chez lui" Enamel
Perfected Paint Remover

"SIMPLE" VENTILATOR FOR SASH WINDOWS.

ENTIRELY NEW SYSTEM of GLAZING WITHOUT PUTTY.

PRICES ON APPLICATION.

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THE PHOSPHOR BRONZE CO.

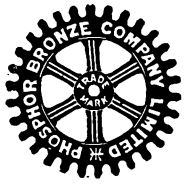
LIMITED.

87 SUMNER STREET, SOUTHWARK, LONDON, S.E.

Rolling and Wire Mills—BAGOT STREET, BIRMINGHAM.

Show Rooms—EXCHANGE BUILDINGS, BIRMINGHAM.

Branch Foundries—{22 LITHERLAND ALLEY, LIVERPOOL, SALEM STREET, ETRURIA, HANLEY.

Sole Makers of the only genuine 

"COG WHEEL" Brand of

"PHOSPHOR BRONZE"

The best and most durable Alloys for Bearings, Bushes, and parts of Machinery exposed to friction and wear. All Ingots bear the full name of the Company, the Registered Trade Mark, a "COG WHEEL," and the distinguishing number of the Alloy. To avoid error or imposture, please specify the manufacture of the PHOSPHOR BRONZE COMPANY, LIMITED, LONDON, or the "COG WHEEL" Brand, as well as the number of the Alloy required. Nos. II, III, V, VII, and XI are the Alloys mostly used. For particulars see our Catalogue.

"DURO METAL"

(REGISTERED TRADE MARK.)

Alloy A, for RAILWAY CARRIAGE, WAGON, and TRUCK BEARINGS. Alloy B, specially adapted for BEARINGS for HOT NECK ROLLS of IRONWORKS, TIN-PLATE MILLS, &c.

WEILLER'S

Patent Silicium Bronze

WIRE for OVERHEAD TELEPHONE, TELEGRAPH, and ELECTRIC LIGHT LINES. High conductivity, great tensile strength, and resistance to corrosion. We are the Sole Proprietors of the Patents for this celebrated Wire for the United Kingdom, India, and all British Colonies and Dependencies.

ROLLED AND DRAWN BRASS OF ALL KINDS;

High Conductivity and other Copper Wire.

FINEST GENUINE BABBITT METAL, "VULCAN" BRAND.

PLASTIC METAL, "COG WHEEL" BRAND. "PHOSPHOR" WHITE BRASS.

PHOSPHOR TIN, "COG WHEEL" BRAND, THE BEST IN THE MARKET.

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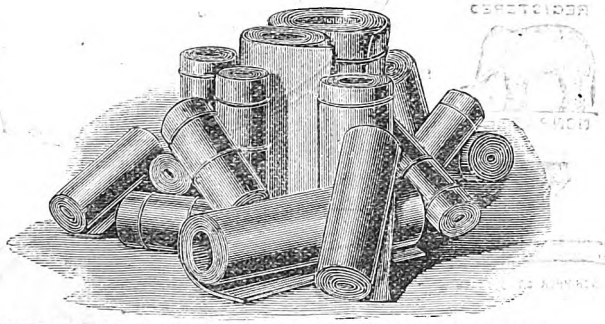
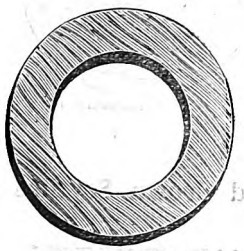
Manufacturers of all kinds of Indiarubber Goods

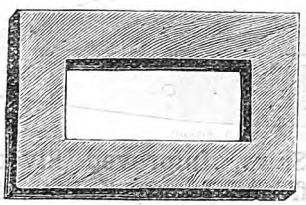
ANDERSONS



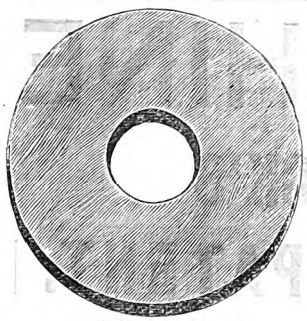
SHEET RUBBER. INSERTION SHEET.



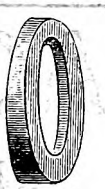
WASHER.



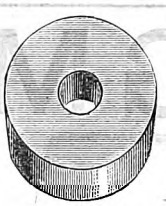
RECTANGULAR WASHER.



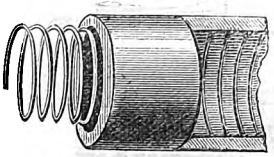
VALVE.



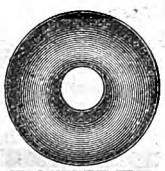
BEVEL WASHER.



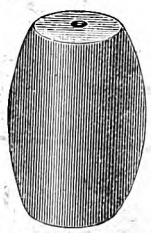
BUFFER.



SUCTION HOSE.



ROUNDED BUFFER.



TRAMCAR BUFFER.

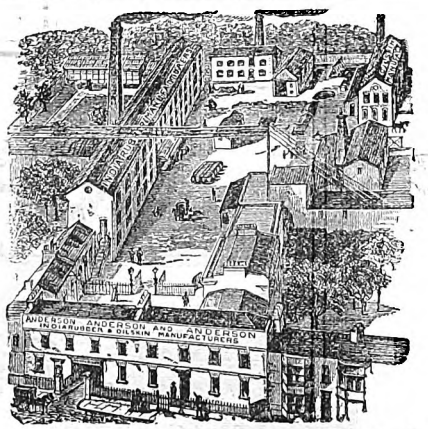
PRICE LISTS OF ALL KINDS OF RUBBER GOODS ON APPLICATION.

37 QUEEN VICTORIA STREET.

Contractors to the Right Honourable the Lords Commissioners of the Admiralty.

TRADE AAA MARK

The War Office, London Metropolitan Police, Secretary of State for India, and the London Metropolitan Fire Brigade.



WORKS—BOW, LONDON, E.

ANDERSON, ANDERSON & ANDERSON,

Indiarubber and Oilskin Manufacturers,

37 QUEEN VICTORIA STREET, LONDON, E.C.

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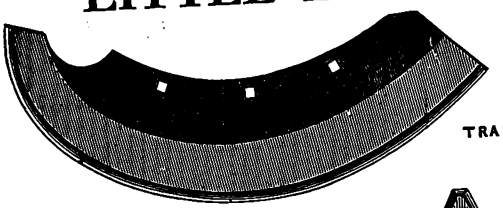
FIRST CLASS AWARD, MELBOURNE, 1889.

W. TYZACK, SONS & TURNER,

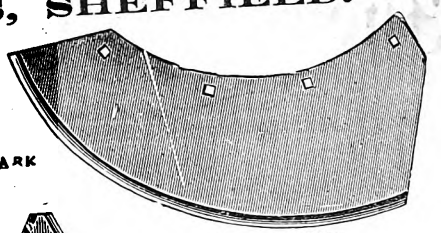
[5]

ESTABLISHED 1812

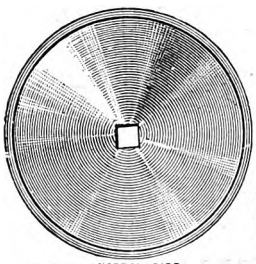
LITTLE LONDON WORKS, SHEFFIELD.

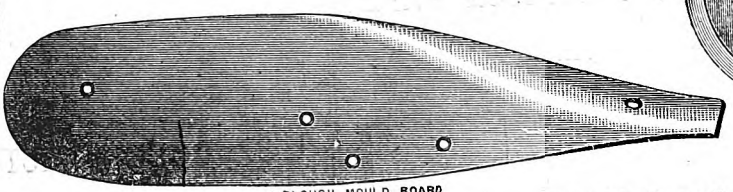

CHAFF MACHINE KNIFE

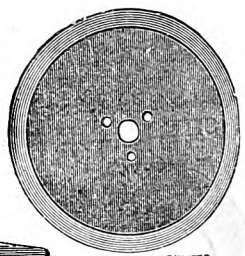
REGISTERED TRADE MARK NONPAREIL


CHAFF MACHINE KNIFE

STRIPPER COMB TOOTH


HARROW DISC


PLOUGH MOULD BOARD

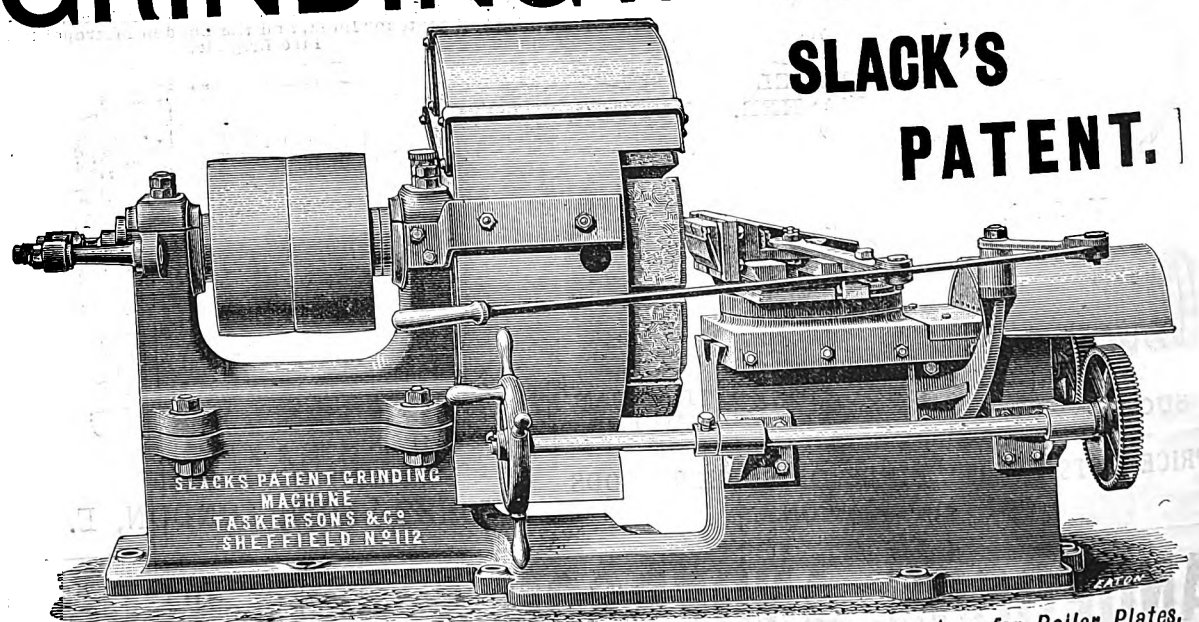

PLOUGH COULTER

Manufacturers of Steel, Hand-cut Files, Saws, Improved Rivetted and Crown Scythes and Hay Knives, Chaff and Turnip Knives, and

MOWING AND REAPING MACHINE SECTIONS AND RIVETS.

GRINDING MACHINE

SLACK'S PATENT.



For Grinding Reaper Sections, Plane Irons, Joiners' Chisels, &c. Larger sizes for Boiler Plates, Engine Work, and Knives of every description.

TASKER, SONS & CO., SHEFFIELD.

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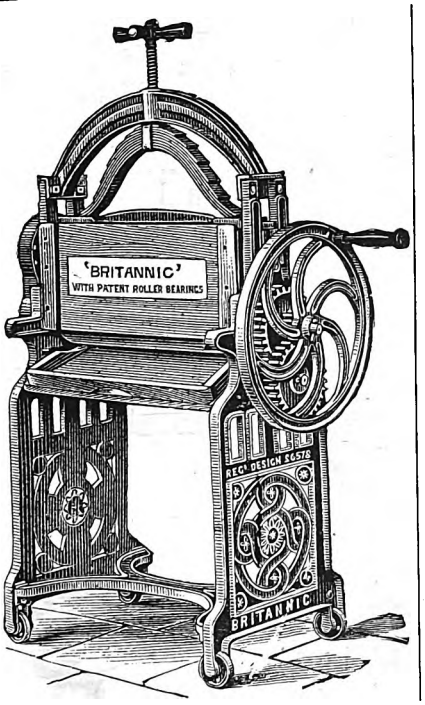
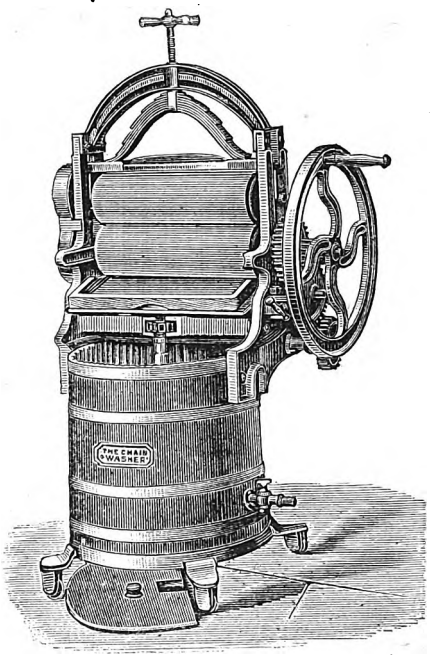
W. & S. SUMMERSCALES' SONS

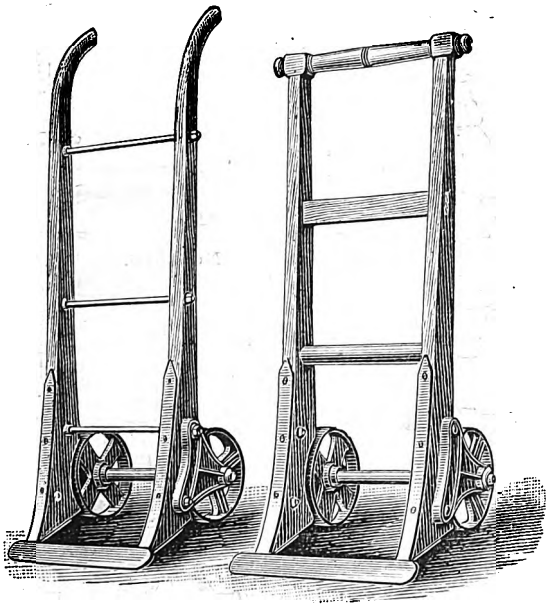


WASHING,
WRINGING,
AND
MANGLING
MACHINES
IN GREAT VARIETY.

SEWING MACHINES
KNIFE CLEANERS
PATENT SAFETY
STEP LADDERS
&c., &c.

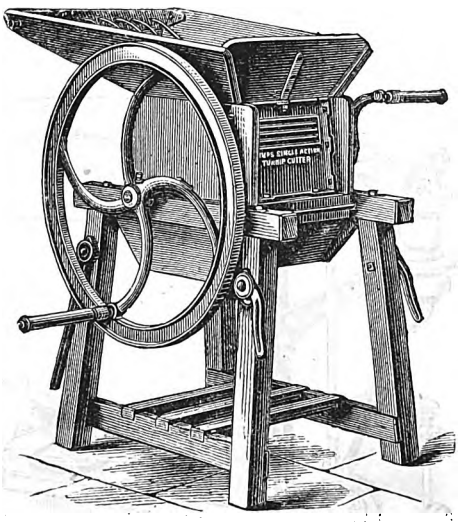


SACK TRUCKS.



Telegrams:
"SCALES
KEIGHLEY."

CHAFF CUTTERS,
PULPERS, SLICERS,
&c., &c.



PARKSIDE WORKS, KEIGHLEY.

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140, 141, 142, and 143 High Holborn ... LONDON.
Victoria Avenue ... MANCHESTER.
130 Bold Street ... LIVERPOOL.
Crescent Iron Works ... SALFORD.

Bradford's Dairy and Laundry Novelties.

1890. 1890.

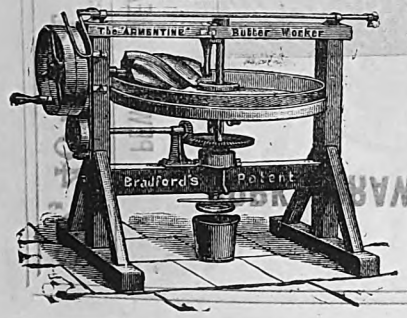
New Illustrated CATALOGUE Free by Post on application.

Bradford's New Patent "Arch Albany" Butter Worker, with Helical Roller.

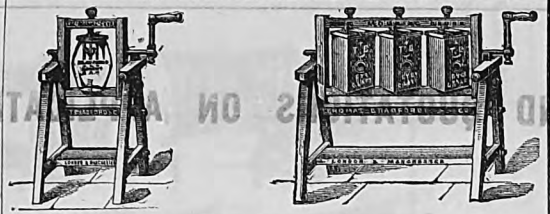
Awarded the Silver Medal of the Royal Agricultural Society of England, 1890.

Awarded the Silver Medal of the Royal Agricultural Society of England, 1890.

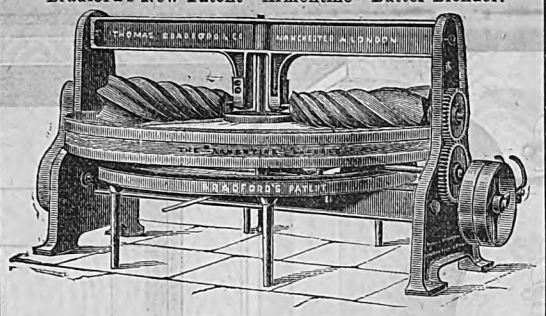
Bradford's New Patent "Armentine" Butter Worker.



Bradford's New Patent "Morning" Churns.



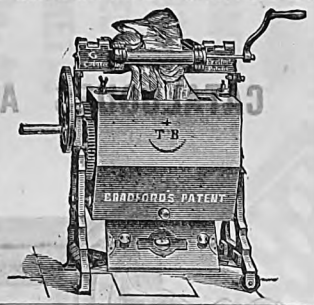
Bradford's New Patent "Armentine" Butter Blender.



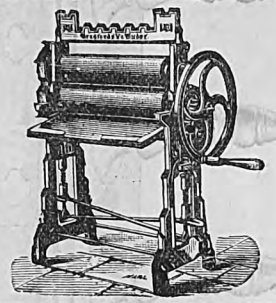
Bradford's New Patent "Post Diaphragm" Churn.

Bradford's New Patent "Arch Alderney" Butter Worker, with Helical Roller.

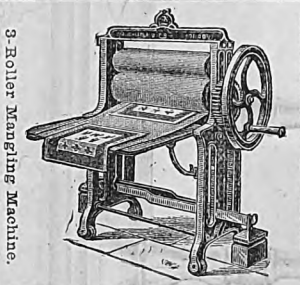
Bradford's New Patent "Ye Tudoress" Washing Machine, with Wringer.



Bradford's New Patent "Ye Tudor" Wringing and Mangling Machine.

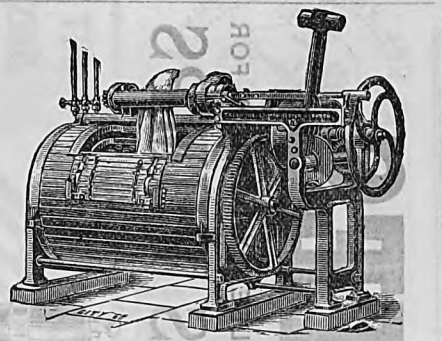


Bradford's New "Midlothian" 3-Roller Mangling Machine.

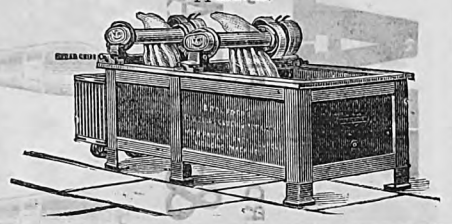


Bradford's New "Mantel" Stove for Drying Closets.

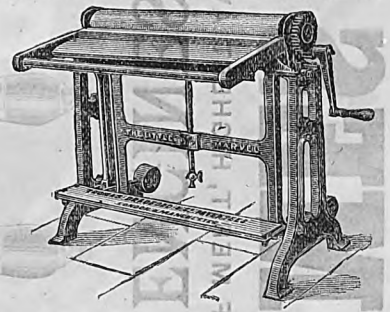
Bradford's New Patent "Woodendway Lubricator" Washing Machine for Steam Power.



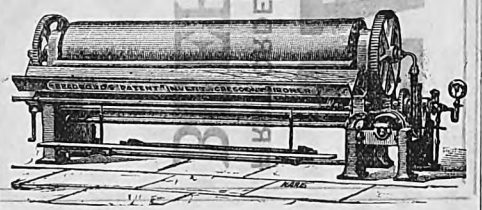
Bradford's New Patent Rinsing and Wringing Apparatus.



Bradford's "Little Marvel" Ironing Machine.



Bradford's New Patent "Invert Crescent" Ironing Machine.



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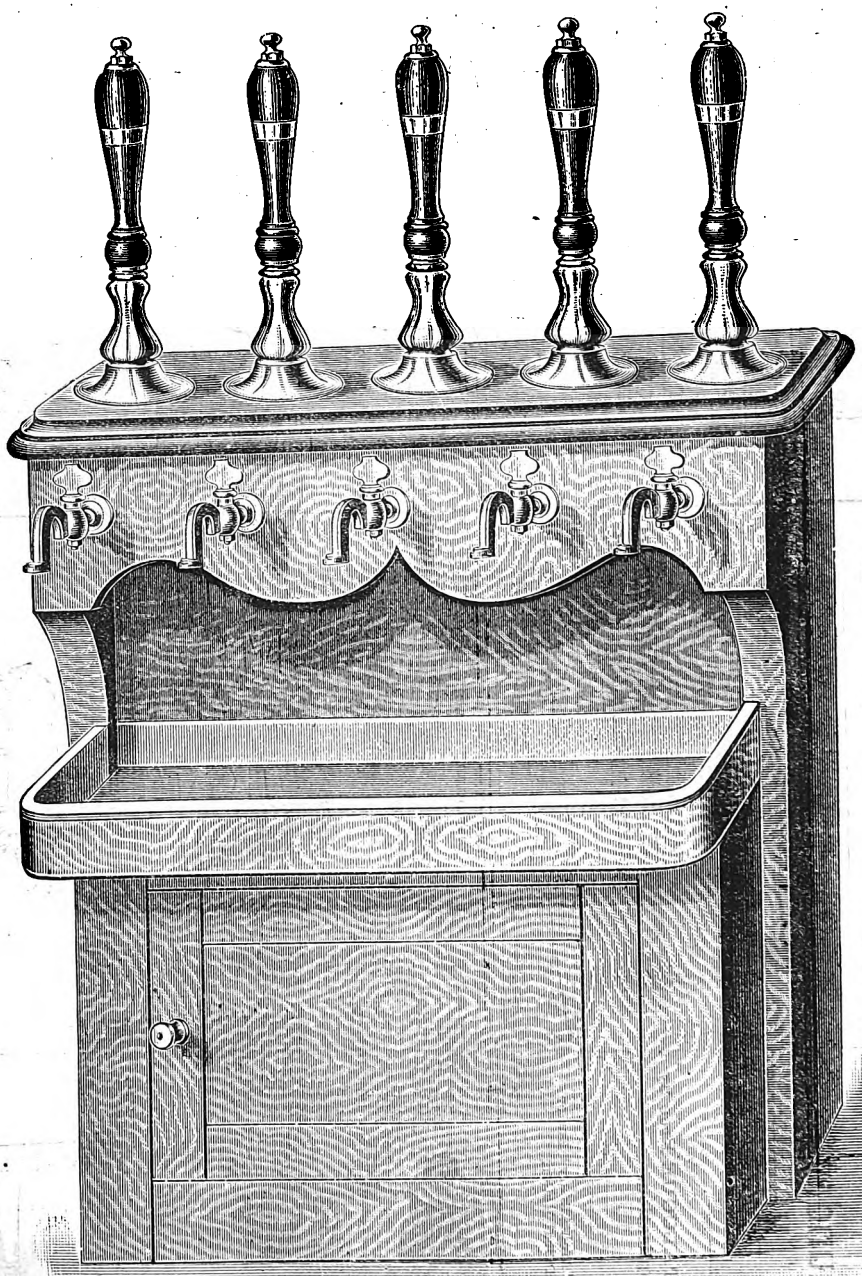
JAMES YATES,

FIRST ORDER OF MERIT, HIGHEST AWARD, ADELAIDE JUBILEE EXHIBITION, FOR

BEER ENGINES & BRASS PUMPS

CORK DRAWERS DRAINERS MANDAL SILVER SPIRIT COCKS ETC.



CATALOGUES AND QUOTATIONS ON APPLICATION.

PEWTER MEASURES, TANKARDS, JUGS, BASINS, INKSTANDS, SYRINGES, ETC.

ESTABLISHED 1826. TELEGRAPHIC ADDRESS—"PEWTER BIRMINGHAM.

39, 40 41, & 42 COLESHILL STREET, BIRMINGHAM.

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THE NORTHERN ENGINEERING CO., LD.

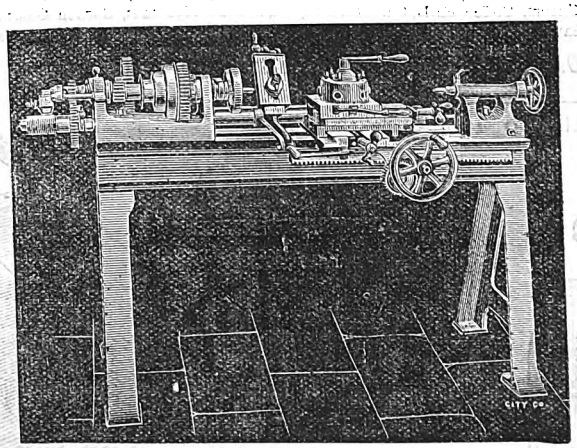
HALIFAX, ENGLAND.

MAKERS OF HIGH CLASS SPECIAL & GENERAL MACHINE TOOLS;

FOR ENGINEERS, BRASS FINISHERS, NUT and BOLT MAKERS,

ELECTRICAL ENGINEERS, SMALL ARMS, CYCLE, and MACHINE MAKERS.

Capstan Lathes.
Tangent Bar Lathes.
Screw Cutting Lathes.
Hollow Mandril Lathes.
Double Stud & Bolt Lathes.
Governor Ball and Hand Wheel Lathes.
High Speed, Geared, and Radial Drilling Machines.
Slot Drilling and Key Bed Cutting Machines.
Screw Planing Machines.
Plate Edge Planing ,,
Anglo-American and other Shaping Machines.



Vertical & Horizontal Milling Machines.
Profiling Machines.
Wheel Cutting Machines.
Vertical & Horizontal Boring Machines.
Complete Plant for finishing Bright Nuts & Bolts.
Special Tools for the production of Shells & other Munitions of War.
Special Plant for Brass Valves & Union Making and other kinds of Brass Work.

ILLUSTRATED CATALOGUE ON APPLICATION

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W. SUMMERSCALES & SONS,

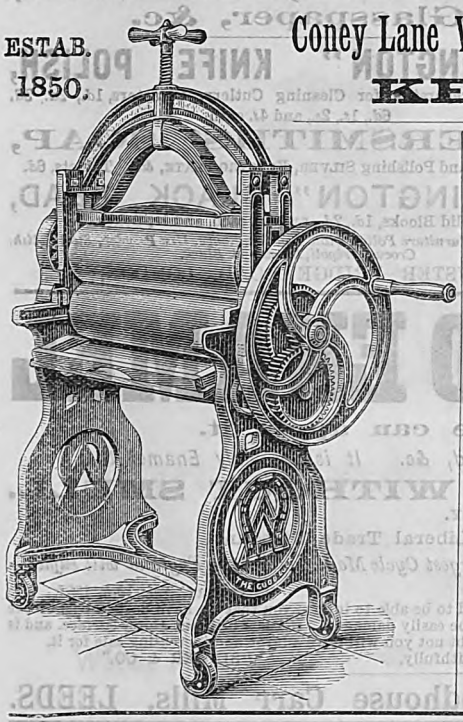
DOMESTIC AND LAUNDRY ENGINEERS

ESTAB. 1850.

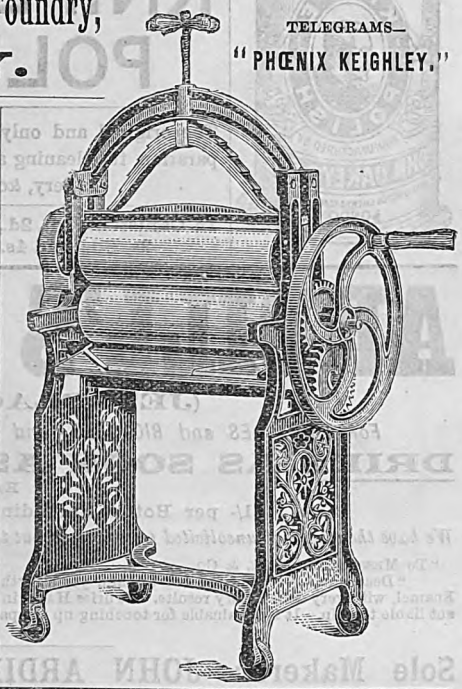
Coney Lane Works and Phœnix Foundry,

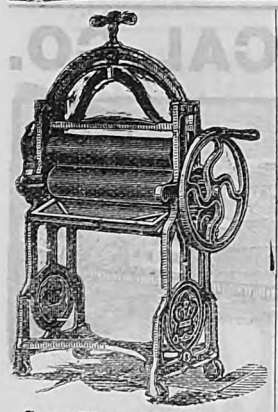
KEIGHLEY.

TELEGRAMS—
"PHŒNIX KEIGHLEY."



Prices and full Particulars
FOR
WASHING,
WRINGING,
AND
MANGLING
MACHINES.
GARDEN ROLLERS,
Garden Seats,
STEP LADDERS.
Agricultural Implements
&c., &c.,
FREE ON APPLICATION.





Crown Diamond" Wringer and Mangle.

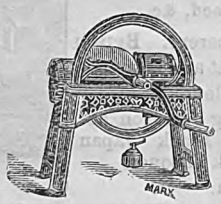
SMITH & PAGET

(Late Whalley, Smith & Paget),
CROWN IRON WORKS, PARKER ST., KEIGHLEY.
Telegraphic Address—"CROWN KEIGHLEY."
Manufacturers to the Trade and Shippers. Wholesale only.
Prize Medals Awarded—
Amsterdam, 1883; *London*, 1884; *Antwerp*, 1885; 2 *Medals*, *Brussels*, 1888.

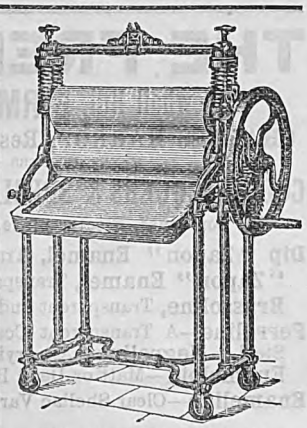
"People's Crown" Washer.

TRADE

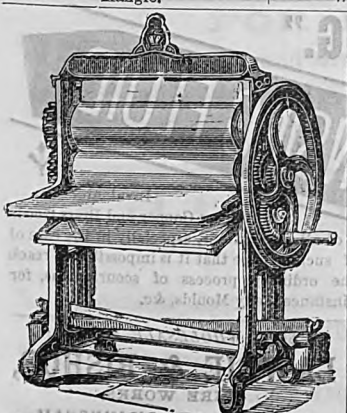
MARK.



Chaff Cutter.



The "Crown Ariel" Mangle.



The Bedford" Lever and Weight Mangle.

The "Crown" Garden Roller.

Washers, Wringers, Mangles, for Cottage, Mansion, or Public Institute.

Chaff Cutters, Oil Cake Breakers, Currant Dressers, Sugar Cutters, Sewing Machines, &c.

CATALOGUES AND PRICE LISTS FREE BY POST.

The "Crown" Dolly Washer.

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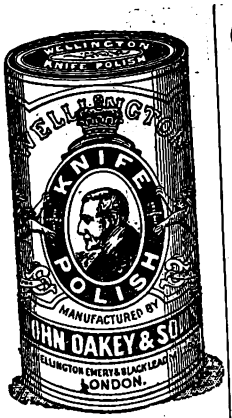

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The original and only reliable preparation for cleaning and polishing cutlery, &c.

In Canisters, 1d., 2d., 3d., 6d., 1s., 2s. 6d., and 4s. each.

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"WELLINGTON" KNIFE POLISH,
The Original Preparation for Cleaning Cutlery. Canisters, 1d., 2d., 3d., 6d., 1s., 2s., and 4s. each.

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For Cleaning and Polishing SILVER, ELECTRO-PLATE, &c. Tablets, 6d.

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In Solid Blocks, 1d., 2d., and 4d. each, and 1s. Boxes.

Polishing Paste, Furniture Polish, Plate Powder, Rouge, Urn Powder, Steel Polish, Crocus, Tripoli, Brunswick Black.

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(JET BLACK). **Anyone can apply it.**

For TRICYCLES and BICYCLES, and all articles of Metal, Wood, &c. It is the only Enamel that

DRIES AS SOON AS APPLIED, WITHOUT SMELL.

HARD, SMOOTH, AND GLOSSY.

1/- per Bottle (including Brush for applying). Liberal Trade Discount.

We have thousands of unsolicited testimonials, but the following from one of the largest Cycle Manufacturers in England will suffice—

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"To MESSRS. J. ARDILL & Co.

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"We remain, yours faithfully, "SINGER & CO."

Sole Makers:—JOHN ARDILL & CO., Woodhouse Carr Mills, LEEDS.

THE FREDK. CRANE CHEMICAL CO.

22 Newhall Hill, **BIRMINGHAM,**

CHARLES HARROP, Resident Manager.

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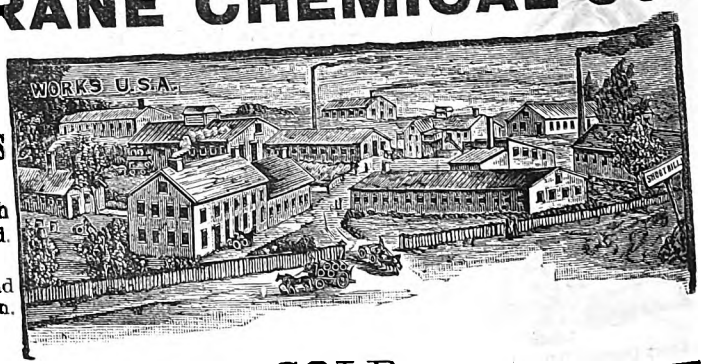
For Brass, Electro-plate, Wood, &c.

Dip "Zapon" Enamel, Transparent. **Brush "Zapon" Enamel,** Transparent and Coloured.
Brassoline, Transparent and Coloured.
Ferroline—A Transparent Coating for Iron and Steel. **Negroline**—Air-drying Black Japan.
Enameloid—Matt or Dead Black Lacquer.
Enameline—Clear Shellac Varnish.



☞ ALL APPLIED COLD.

"RETINNING." "RETINNING." "RETINNING."

No Burning off. No Scouring. No Obnoxious Smells.

A Saving of 75 per cent. is effected in time and labour by using THE PATENT CLEANSING FLUID, For Cleansing Copper and Brass Goods preparatory to Retinning.

THE PATENT COPPER & BRASS CLEANSING FLUID

Invaluable for Retinning Copper and Brass Goods of all descriptions, especially in the case of vessels of such a shape that it is impossible to reach every part by the ordinary process of scouring, as, for instance, Jelly Moulds, &c.

Write for Sample Bottle; sent Carriage Paid for 1s.

Patentee and Sole Manufacturer:
W. SHARP,
IRONMONGER,
53 GRANBY ST., LEICESTER.

SOLE WHOLESALE AGENTS:
LAWRIE & BISHOP,
WIRE WORKS,
BRADFORD ST., BIRMINGHAM.

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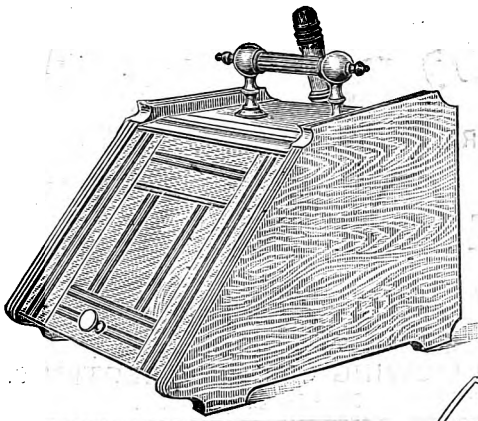
H. J. HOOKHAM & SONS

Charles Henry Street, BIRMINGHAM.



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Hookham's Patent Piano Wire, Picture Line, &c.

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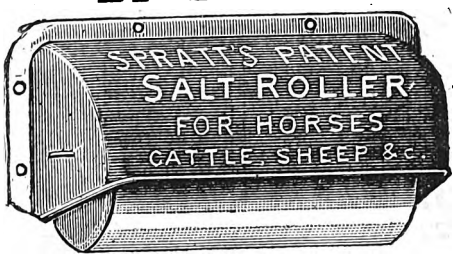

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SALT ROLLERS,

FOR HORSES, CATTLE, AND SHEEP.

Clean, Healthy, and Ornamental. Made in Galvanized and Grey or Blue Enamelled Iron Brackets, retailing at 1s., 1s. 6d., and 2s. each respectively.

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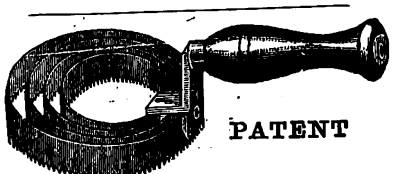

PATENT

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Cleans a Horse QUICKER and BETTER than any other Comb. AS SOFT AS A BRUSH. Retailing at 1s. each Japanned Black, or 1s. 6d. each Nickel-plated.

Wholesale terms of Spratt's Patent (Limited), Bermondsey, London, S.E.

OR YOUR WHOLESALE HOUSE.

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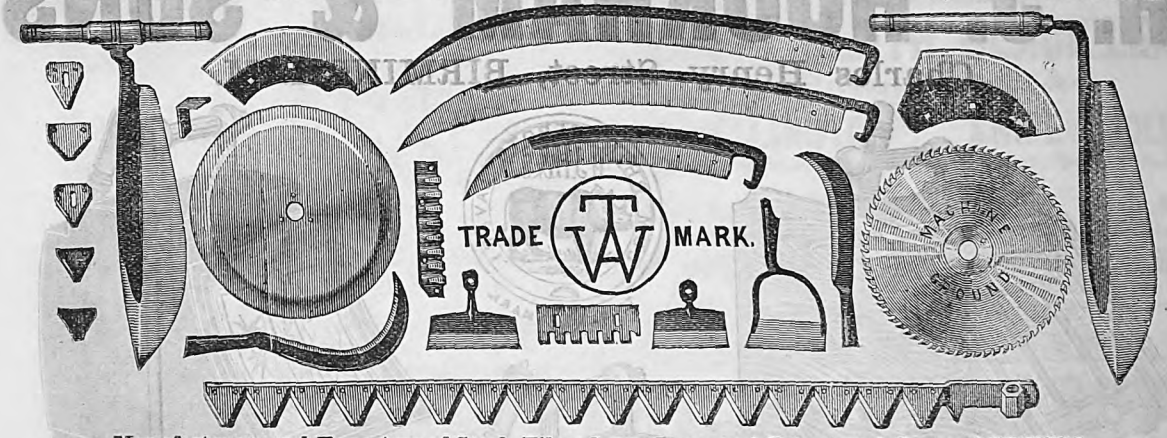

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HAY, STRAW, AND TURNIP KNIVES, REAPING AND MOWING MACHINE SECTIONS.
And every description of KNIFE for AGRICULTURAL PURPOSES. *Price List on application.*

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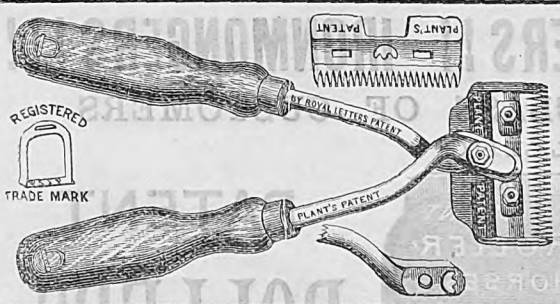
PRICE LISTS AND TESTIMONIALS ON APPLICATION.

INDUSTRY WORKS, SHEFFIELD.



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THE BEST VALUE IN THE MARKET.

These Machines have been well tested, and do the work easier and better than any other Clippers made. They have a cog action, which is carefully hardened to prevent wear. They are more durable than any other make, being of the best material and workmanship. Every Machine is tested before being sent out.

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To be had of all Merchants, Factors, and Saddlers' Ironmongers. Prompt attention given to Sharpening and all kinds of Repairs.

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W. & J. PLANT, Bloomsbury Works, Wolverhampton.

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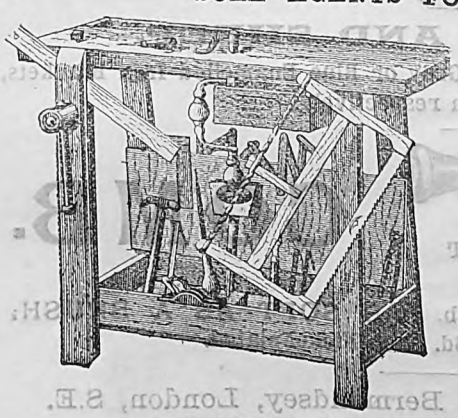
SOLE AGENTS FOR MESSRS. PEUGEOT BROTHERS,



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Specialities in Horse Clippers and Hairdressers' Clips. All Forged Steel. [1]

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SPEAR AND DAGGER KNIVES.

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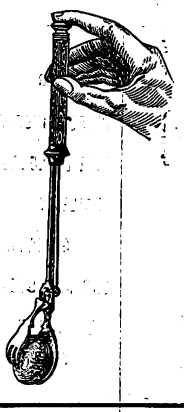

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The Best in the Market;
Entirely Novel;
Not liable to get out of order;
Grasps instead of Stabbing the Pickle.

Write for Prices to Patentee and Sole Maker,

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Patent Pickle Forks, Salad, Sardine, and Asparagus Servers,
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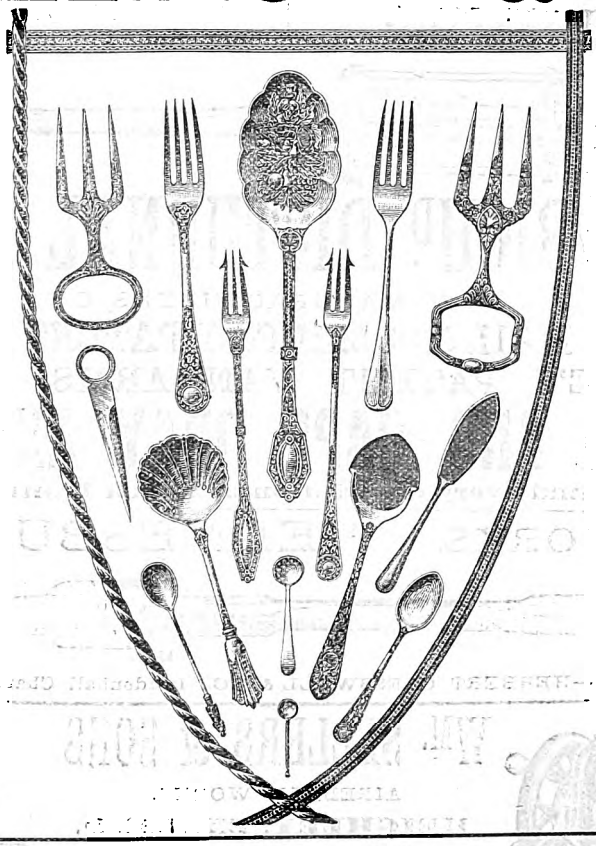
SHEFFIELD.

W. GALLIMORE & SONS,

MANUFACTURERS, STAMPERS, AND ROLLERS TO THE TRADE.

TELEPHONE No. 193.

TELEGRAMS:
'GALLIMORE SHEFFIELD.'



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CROSS-ROLLED and **CUT-OUT BLANKS,** including Carvers, Eaters, Butters, Pickles, Jam Spoons, Spades and Shovels, &c., in Nickel Silver and Brass.

FIDDLE, OLD ENGLISH, and Fancy Stamped **BLANKS,** including Rat-tail, Italian, Prince of Wales, &c., &c.

BREAKFAST, SALT, and **MUSTARD SPOONS,** in a great variety of Patterns, in N.S. and Brass.

TUBING in the various shapes and sizes.

BALLS, round and squat, in all sizes.

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COPPER TAPE for Lightning Conductors.

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Brass & Copper,
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ARUNDEL STREET,
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(ESTABLISHED 1845),

WOLVERHAMPTON,

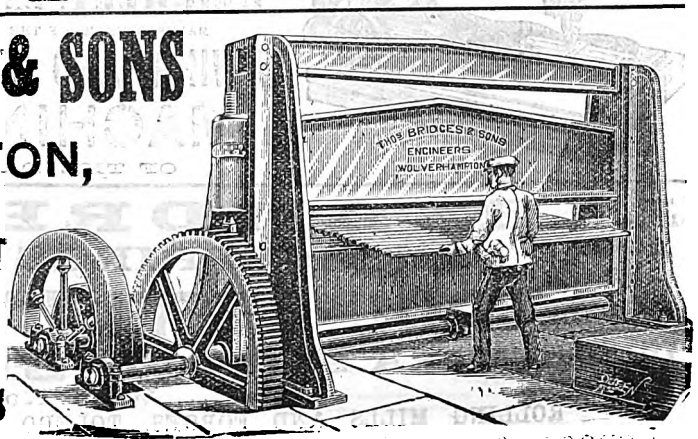
MANUFACTURERS OF

CORRUGATING MACHINES

And all Machinery for the Corrugating and Galvanising Trade.

GUTTERING MACHINES

AND THEIR ACCESSORIES.



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FOR CYCLE MAKERS, ENGINEERS, MACHINISTS, AGRICULTURAL IMPLEMENTS, DOMESTIC APPLIANCES, &c.

Malleable Iron Castings

FOR BRASSFOUNDERS, BOAT BUILDERS, RAILWAY SIGNALS, GAS AND STEAM ENGINEERS, &c.,

CHAMPION FOUNDRY, FREETH STREET
BIRMINGHAM.

J. & J. HUGHES

Manufacturers of BRASS, GUN METAL, & PHOSPHOR BRONZE in INGOTS.

INGOT BRASS, GUN METAL, AND PHOSPHOR BRONZE

NEOUS CASTINGS.

Established 1830.

Dealers in Metals

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Bicycle and Tricycle Castings Mill Brasses, Axle Caps, Nuts, and Collets.

CASTERS IN BRASS, GUN METAL, AND PHOSPHOR BRONZE.

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DRABBLE'S PATENT VAN ARMS,

AUSTRALIAN AND CAPE DRAY AXLES,

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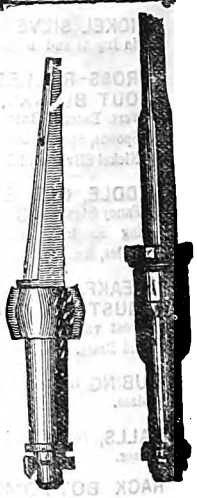
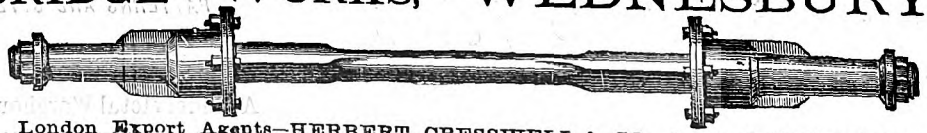
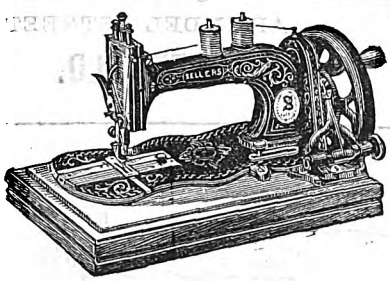




London Export Agents—HERBERT CRESSWELL & CO., Leadenhall Chambers, 4 St. Mary Axe,



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MANUFACTURERS OF THE LEADING

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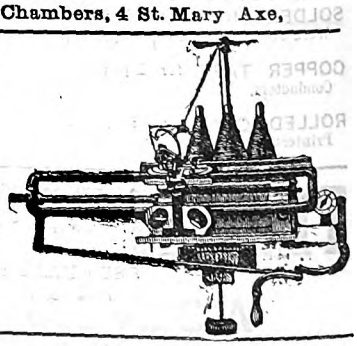
OF THE DAY.



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REGISTERED TOLEDO

Manufacturers of SPRINGS for Carts, Vans, Lurries, and Carriages;

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BY HER MAJESTY'S ROYAL LETTERS PATENT.

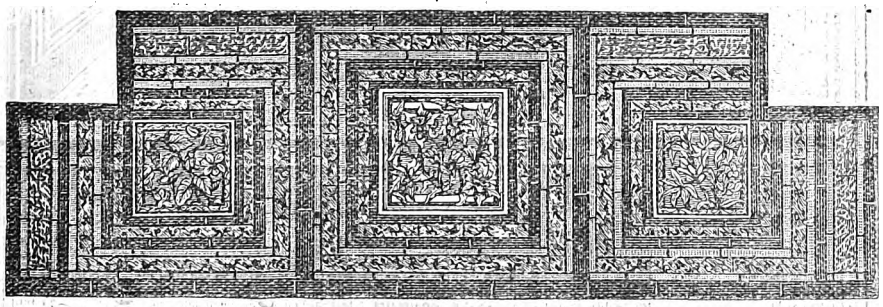
SHERWIN & COTTON

HANLEY, STAFFORDSHIRE,

MANUFACTURERS OF

SLABBED ART-TILE PANELS,

Patterns and Prices on Application.



Patterns and Prices on Application.

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ENAMELLED TILES,

FOR HEARTHS, STOVES, CABINET WORK, &c.

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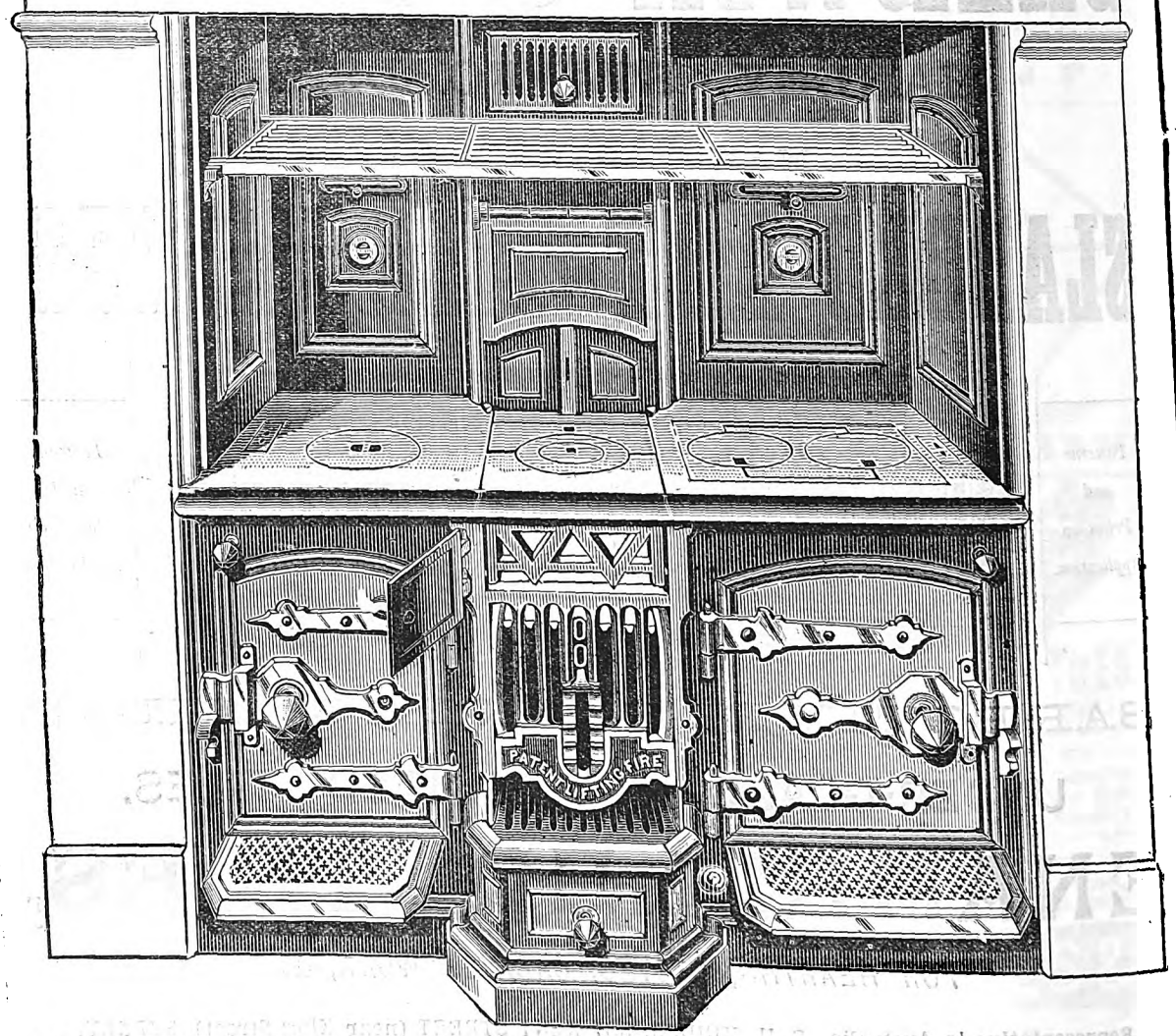
RUSSELL'S PATENT "HERALD"
COMBINED
OPEN AND CLOSE FIRE KITCHENER

BY HER MAJESTY'S ROYAL LETTERS PATENT.



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Are the Patentees and Manufacturers of this excellent lifting fire range; it is the only lifting fire in the market that will not stick or get out of order, as there are no working parts in the fire. The immense sale and general satisfaction they have given is the best guarantee of their superiority over all other ranges of this description. There is a clear saving of 50 per cent. in fuel.

Makers of all kinds of kitchen ranges, drawing, dining, and sitting room stoves. Originators
Inventors and Patentees of the celebrated Excelsior ranges.

DRAWINGS AND PRICES ON APPLICATION, TO THE TRADE ONLY.

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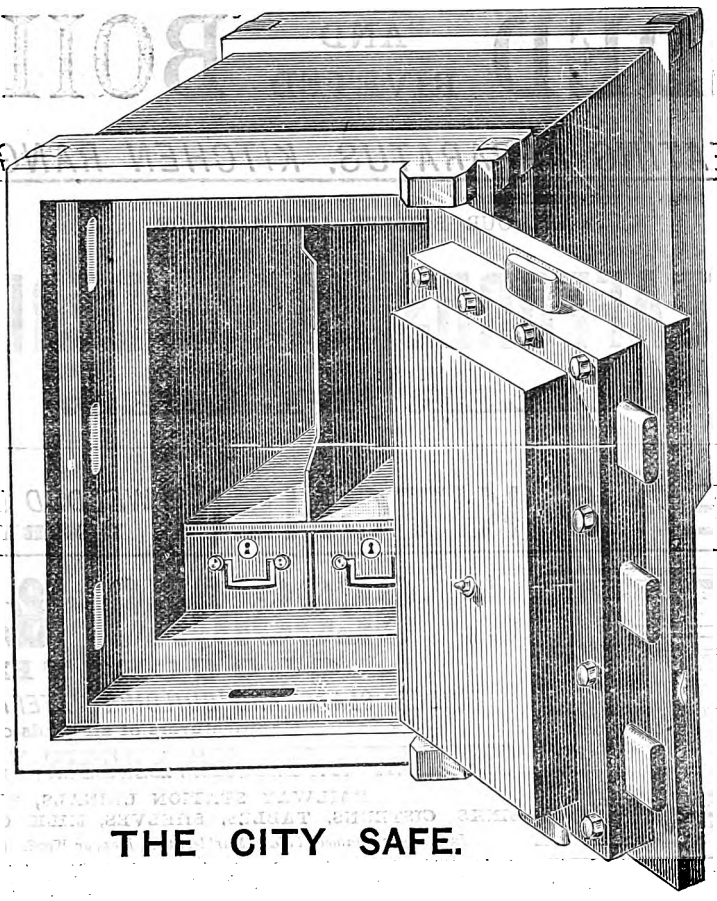
WHITFIELD'S



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THE CITY SAFE.

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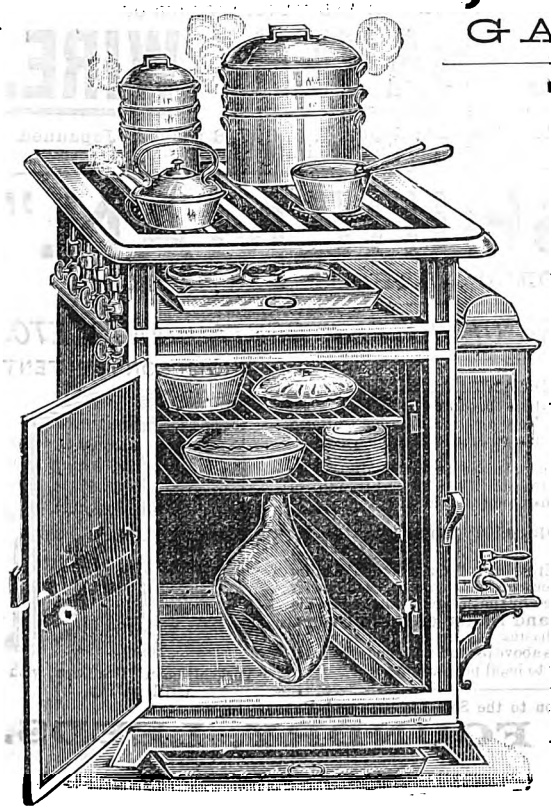
GAS ENGINEERS.



THE ARTIZAN'S COOKER.

ALL CAST IRON.

	Outside Dimensions High	Wide	Deep	Price Single-cased £ s. d.
No. 0 ...	28 in. ×	16 in. ×	15½ in.	1 15 0
„ 1 ...	29 „	19 „	16½	2 0 0
„ 2 ...	31 „	20 „	19	3 0 0
„ 3 ...	32 „	21 „	19	3 10 0
„ 4 ...	33 „	22 „	20	4 5 0
„ 5 ...	34 „	23 „	21	5 5 0

All made with Grilling Burners on Top.

SINGLE-CASED.

Fitted with Cast Front, Door and Top, and Wrought-iron Back and Sides.

No.	Inside Dimensions of Roaster High	Wide	Deep	Burners on Hot-plate	Price £ s. d.
6100 ...	18 in. ×	10 in. ×	10 in. ...	1 ...	1 10 0
6110 ...	20 „	11 „	10 ...	1 ...	1 15 0
6120 ...	22 „	12 „	12 ...	2 ...	2 5 0
6130 ...	23 „	13 „	13 ...	2 ...	2 15 0
6140 ...	24 „	14 „	14 ...	3 ...	3 10 0
6150 ...	25 „	16 „	16 ...	3 ...	4 0 0
6160 ...	26 „	18 „	18 ...	4 ...	5 10 0

Copper Boilers extra.

WRITE FOR LISTS.

FREEMAN ST., BIRMINGHAM.

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WELDED AND RIVETED BOILERS

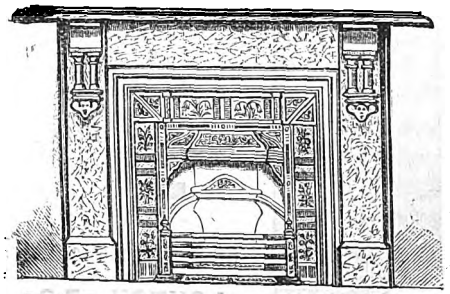
FOR HEATING APPARATUS, KITCHEN RANGES, &c.

ALL OUR BOILERS ARE MADE OF

BEST STAFFORDSHIRE OR DERBYSHIRE

BOILER PLATES.

MATHER & KITCHEN, *WELDED BOILER WORKS,* DERBY, ENGLAND.



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TIMBER, SLATE, AND BUILDING MATERIAL MERCHANTS.

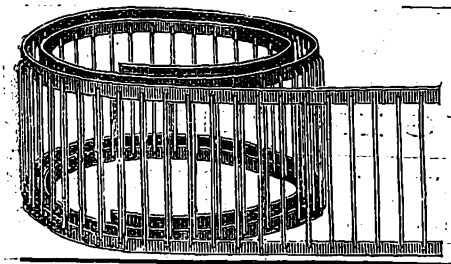
Manufacturers of all kinds of

CHIMNEYPIECES, BATHS, LAVATORIES,

RAILWAY STATION URINALS, CLOSETS,
SINKS CISTERNS, TABLES, SHELVES, MILK COOLERS, &c., &c., &c.

In Plain or Enamelled Slate, Marble, Stone, Iron, or Wood. (Write for Price Lists.)

WRITE FOR REDUCED PRICES.



J. STARKIE, WIRE WORKS, PRESTON,

ORIGINAL INVENTOR AND MANUFACTURER OF

COAL SAVER WIRE.

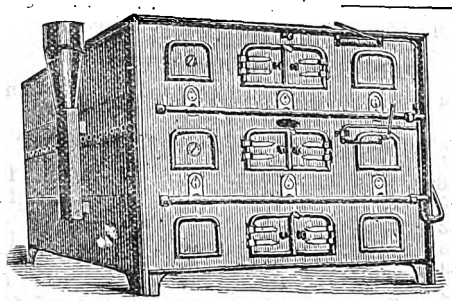
Made in 12-foot lengths; depth, 4, 5, 6, 7, 8 inches. Japanned Black, or Galvanised after made.

THE "YORKSHIREMAN."

THE ONLY GAS OVEN IN THE WORLD WITHOUT GAS INSIDE.

TO BAKERS, CONFECTIONERS, PROPRIETORS OF HOTELS, RESTAURANTS, ETC.

NO GAS INSIDE.



The "Yorkshireman" Two Decker, with Proving Oven.

ADVANTAGES.

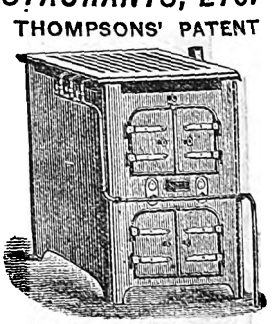
No Gas inside where Bread is Baked or Food Cooked; Bottom, Top, and Sides all one Uniform Heat; Retention of Heat; Economy, &c.

SIZES.—The sizes, made in either Single or Double Deck, are from 1 ft. 6 in. by 1 ft. 1 in. to 6 ft. by 10 ft., inside measurements.

IMPORTANT NOTICE.

Messrs. Thompson Brothers, the original Patentees of the "Yorkshireman" Gas Oven, having made an assignment of their Patent, Mr. Towler has been appointed by the present owners to be the **Sole Licensee and Maker of these Ovens.** Any person purchasing any oven which is an infringement of this above patent, will render himself liable to legal proceedings.

THOMPSONS' PATENT



"Yorkshireman" Gas Oven, with Grills on Top.

Further Particulars and Prices on Application to the Sole Licensee and Maker,

WM. TOWLER, GLOBE FOUNDRY, LEEDS.

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FREDERICK MILAN,

MANUFACTURER OF

HEATING & VENTILATING SPECIALTIES,

HYDRO WORKS

LOCKWOOD, HUDDERSFIELD.

MILAN'S PATENT

HYDRO-PNEUMATIC RADIATOR.

This Radiator has the advantage over all others of occupying less space; gives more radiating surface with less water; saves from 30 to 50 per cent. in fuel; admits fresh warm air in winter cold air in summer; disinfects and purifies the air (the only Radiator with this arrangement); neat in appearance; no coil case required; direct radiant heat which is essential to all heating; large pipes entirely dispensed with; high pressure practically reduced to low pressure; less boiler required and quicker circulation than has hith rto been accomplished; easily fixed to existing apparatus; will work connected with ¼-in. to 1-in. pipes, giving same results as ordinary coils connected with 2-in. to 4-in. pipes.

Illustrated Price List on application.

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CORUNDUM.

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THE SCANDINAVIAN STOVES

ECLIPSE ALL OTHERS

BY THEIR

ECONOMY

SAFETY,

PORTABILITY,

CLEANLINESS,

UNIFORMITY OF TEMPERATURE,

ABSENCE OF SMOKE.

FOR USE IN

CHURCHES,

SCHOOLS,

WAREHOUSES,

OFFICES,

WORKSHOPS

HALLS

SITTING & BED ROOMS.

The SCANDINAVIAN STOVE CO., Ld., 47 OXFORD STREET, LONDON, W.

RHODES'

PATENT

ASBESTOS SEATED STEAM VALVES

AND WATER GAUGE FITTINGS

Are allowed by users to be the best and most reliable in the market. They have now stood the test of nine years, and are still increasing in favour.

RHODES' ASBESTOS COMPOUND

Is the best jointing material, suitable for joints of all descriptions.

Beware of spurious imitations, and see that each sheet bears the "Colossus" brand. Prices, &c., of the Patentee,

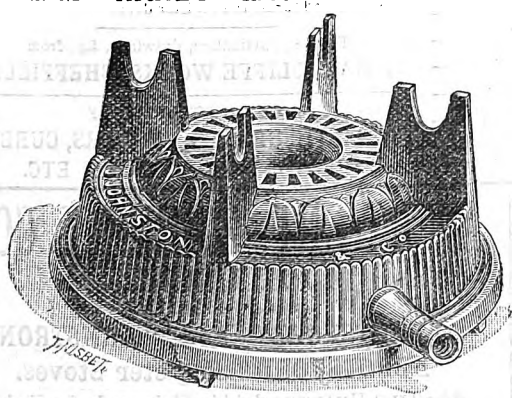
B. RHODES,

234 & 240 BOW ROAD, LONDON, E.

J. JOHNSTON & CO.'S

PATENT "HANDY" GAS BOILING STOVES

THE BEST



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A COMPLETE NOVELTY IN GAS STOVES.

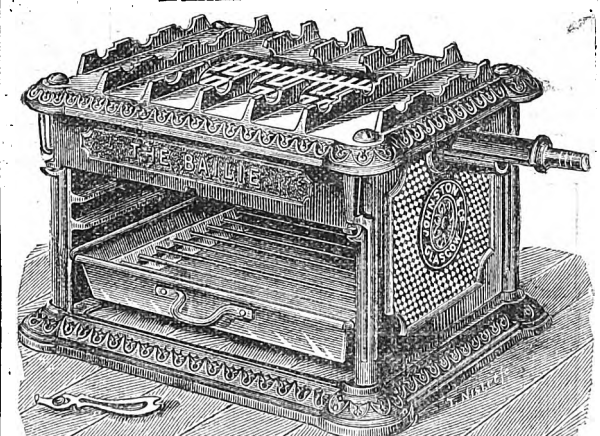
The long, projecting, and awkward mixing chamber present in all stoves hitherto produced is entirely got rid of, and, by a new arrangement, perfect mixture of the air and gas and the **Handiest and most Compact form possible** are secured.

	Diameter of solid flame	Diameter of stove	Price, each
Handy No. 10 ..	2¾ inch	6 inch	1s. 4d.
Handy No. 12 ..	4 „	8 „	1s. 10d.

GAS FIRES for season, comprising some new patented improvements, and of novel and artistic designs, will be ready by end of the month.

NEW AND IMPROVED GAS COOKER

THE "BAILIE."



FOR BOILING, FRYING, GRILLING, TOASTING, &c.

Size, 12 ins. long × 10 ins. wide × 7½ ins. high. Price, 7s. 6d.

The "Bailie" comprises the following advantages and improvements:—

Its construction is thoroughly strong and reliable, the top and bottom plates, which are both continuous, all-round castings, being held together along with the sides and back by four strong bolts passing from top to bottom.

The Burner is arranged so that a solid flame from each side is produced, and the deflector admits of regulating the heat upwards and downwards to any extent desired.

The front is provided with two Plates, one of which can be dropped down or raised, so as to admit more or less cold air as may be wanted.

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AND

THE ROTHERHAM FOUNDRY CO., LIM.,

EFFINGHAM WORKS, ROTHERHAM.

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MANUFACTURERS OF

Tile Stoves	Mantel Shams and Registers	Cooking Apparatus for Hotels, &c.	Garden Chairs
Register Stoves	Mantel Pieces with Over Mantels	Grills for Restaurants and Dining Rooms	Hat and Umbrella Stands
Dog Stoves	Tile Hearth Curbs	Gates and Railings	Iron Tables for Restaurants
Gas Cooking Stoves	Kitcheners		Marble Chimney Pieces
Gas Heating Stoves			

Telegraphic Address—"EFFINGHAM."

ROTHERHAM. LONDON. LIVERPOOL. MANCHESTER.

CATALOGUES FREE ON APPLICATION.

THE "MARLBOROUGH" GARLAND'S PATENT, No. 13355.

STEEL & GARLAND

WHARNCLIFFE WORKS, SHEFFIELD.

SHOW ROOMS—
16 CHARTERHOUSE ST., HOLBORN CIRCUS, LONDON.

No. 110A.—CANOPY SHOWN CLOSED.

SECTION.—Canopy shown OPEN.

Where may be seen in operation the

"MARLBOROUGH" GRATE

(GARLAND'S PATENT).

Advantages.—The projecting brick throws the heat into the room; is more easily fixed than any other Grate; the canopy is adjustable, and the draught can be regulated at pleasure; the canopy will lift out for fixing the Grate or sweeping the chimney; the canopy when closed forms the register door.

Further particulars, drawings, &c., from

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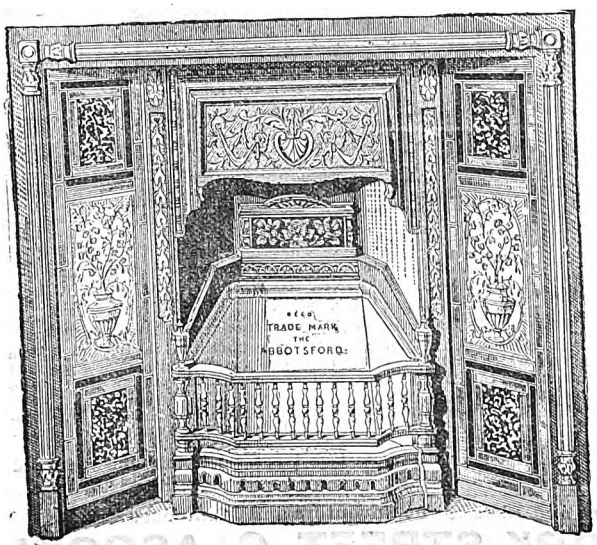
ARTISTIC GRATES, FENDERS, CURBS, RESTS, FIRE BRASSES, ETC.



DERWENT FOUNDRY CO.

DERBY,

MANUFACTURERS OF

"ABBOTSFORD" and "ARMSTRONG ABBOTSFORD" Register Stoves.

Also TILE HEARTHS, *laid in Slabs ready for Fixing.*

CAUTION.—The great celebrity of the

ABBOTSFORD STOVES

has called forth a number of spurious imitations which, in some cases, have been bought for the Genuine Article, and have caused serious disappointment to the purchasers.

We beg, therefore, to inform the Trade that the Genuine Article always bears the Registered Trade Mark "ABBOTSFORD," from the Makers—

THE DERWENT FOUNDRY CO., DERBY.

CAUTION.—None are genuine without the Trade Mark The "ABBOTSFORD."

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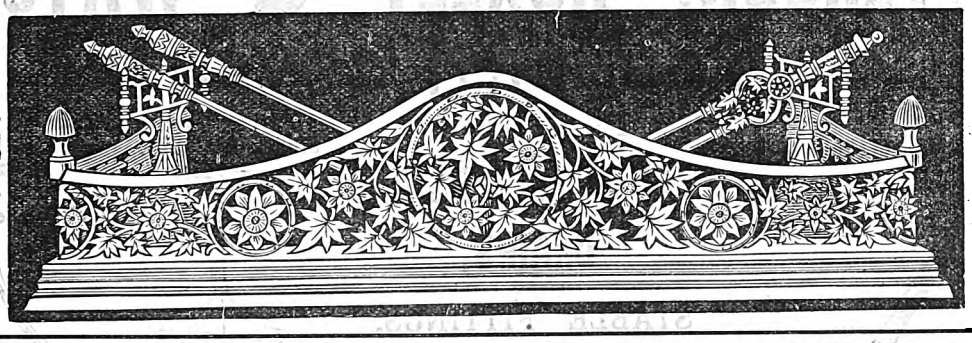
Patentees and Manufacturers of Fire-Brasses, Rests, Brass Fenders, Ash-Pans, Umbrella-Stands, Fire-Screens Fire-Guards, Companion-Stands, and General Brassfounders.

ESTABLISHED 1867.



SPECIALITY. "THE HEARTH." *Books and Prices on application.*

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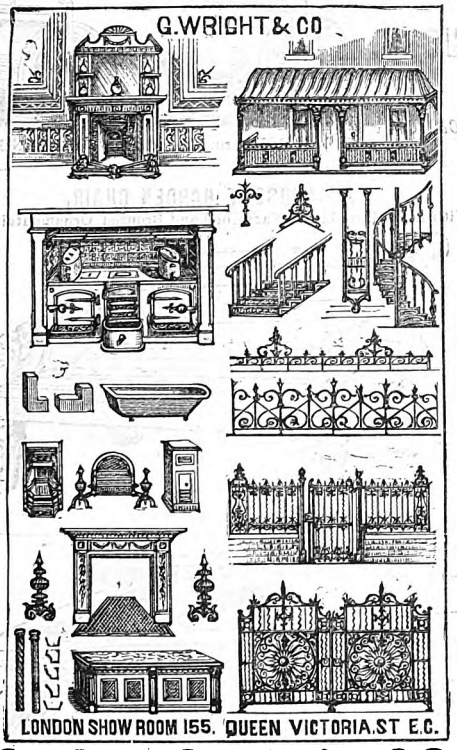

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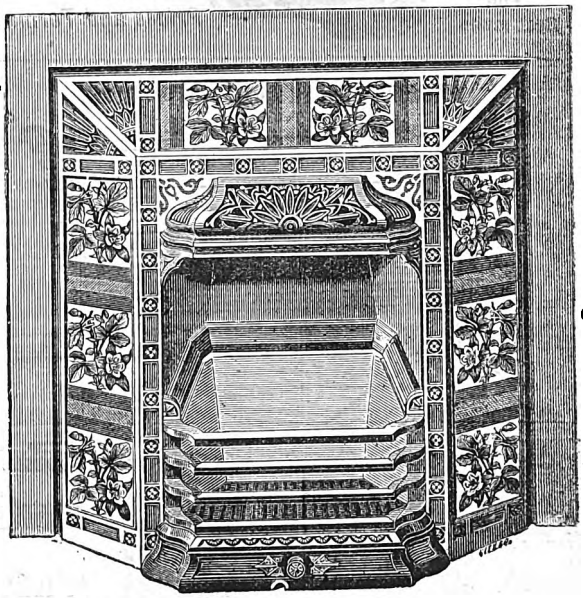
Have at the above address the largest Show-rooms in London for Stove Grates, Kitchen Ranges, Marble and Carved Wood Chimneypieces, Tiles, Verandahs, Balconies, Gates, Railings, &c. Heating and Ventilating, Hot-water Work, Coil Cases. "Burton Weir," Tile Panels, and Hearths.

WORKS, ROTHERHAM. Established 1854

THE BATHS FOUNDRY CO., LD.

ROTHERHAM.



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INQUIRIES INVITED FROM THE TRADE ONLY.

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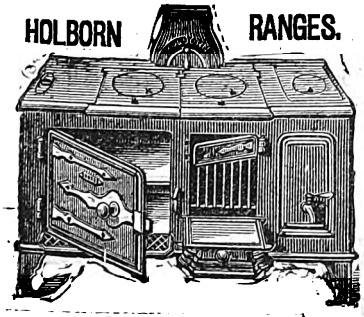

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The Cheapest and most Effectual IN THE MARKET.

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The Largest and best Stock of Open and Close Fire Kitchen Ranges in London.

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MANUFACTURERS OF

PHILADELPHIA LAWN MOWER.

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GARDEN ROLLERS AND CHAIRS,

STABLE FITTINGS,

RANGES & PIG TROUGHS.

Prices and Terms on application.

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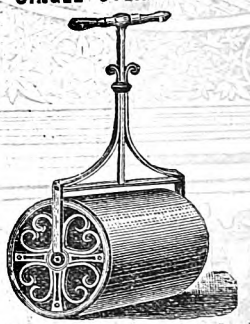
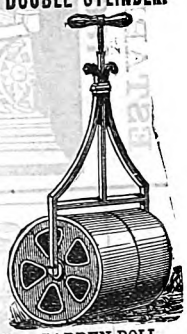
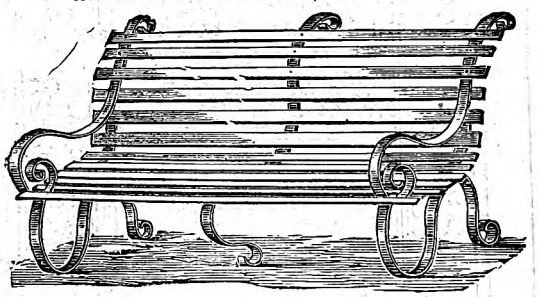
SINGLE CYLINDER. DOUBLE CYLINDER.





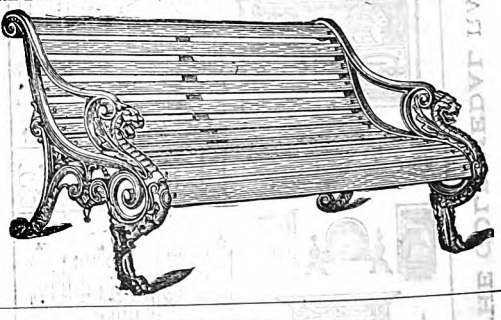
GARDEN ROLL (rounded edges). GARDEN ROLL.

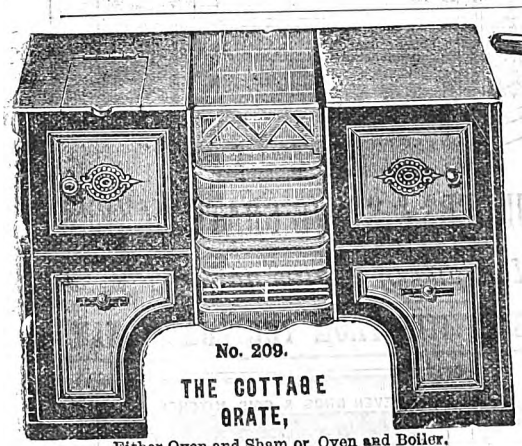
WARWICK GARDEN CHAIR, WITH ARMS.



A HANDSOME GARDEN CHAIR,

With Pitch Pine Laths, Varnished and Bronzed Ornamental Ends.

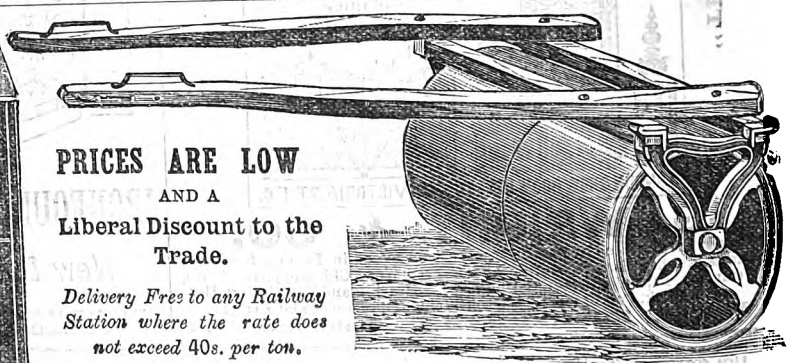




No. 209.

THE COTTAGE GRATE,

Either Oven and Sham or Oven and Boiler.



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AND A

Liberal Discount to the Trade.

Delivery Free to any Railway Station where the rate does not exceed 40s. per ton.

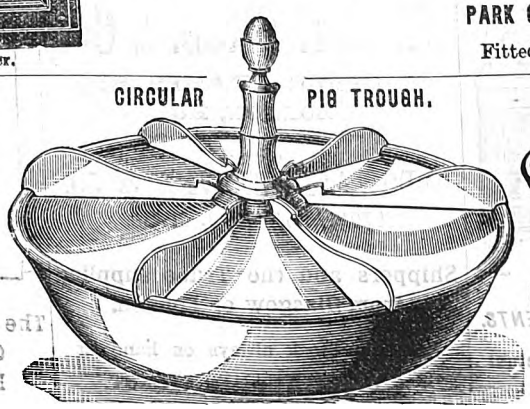
PARK OR CRICKET GROUND ROLL.

Fitted with Wood or Iron Shafts.

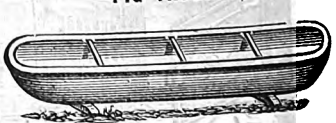
SINGLE NORFOLK PIG TROUGH.

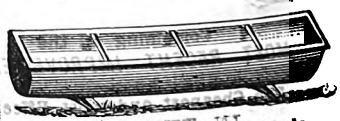
DOUBLE NORFOLK PIG TROUGH.

CIRCULAR PIG TROUGH.



PIG TROUGHS,





With Round or Square Ends.

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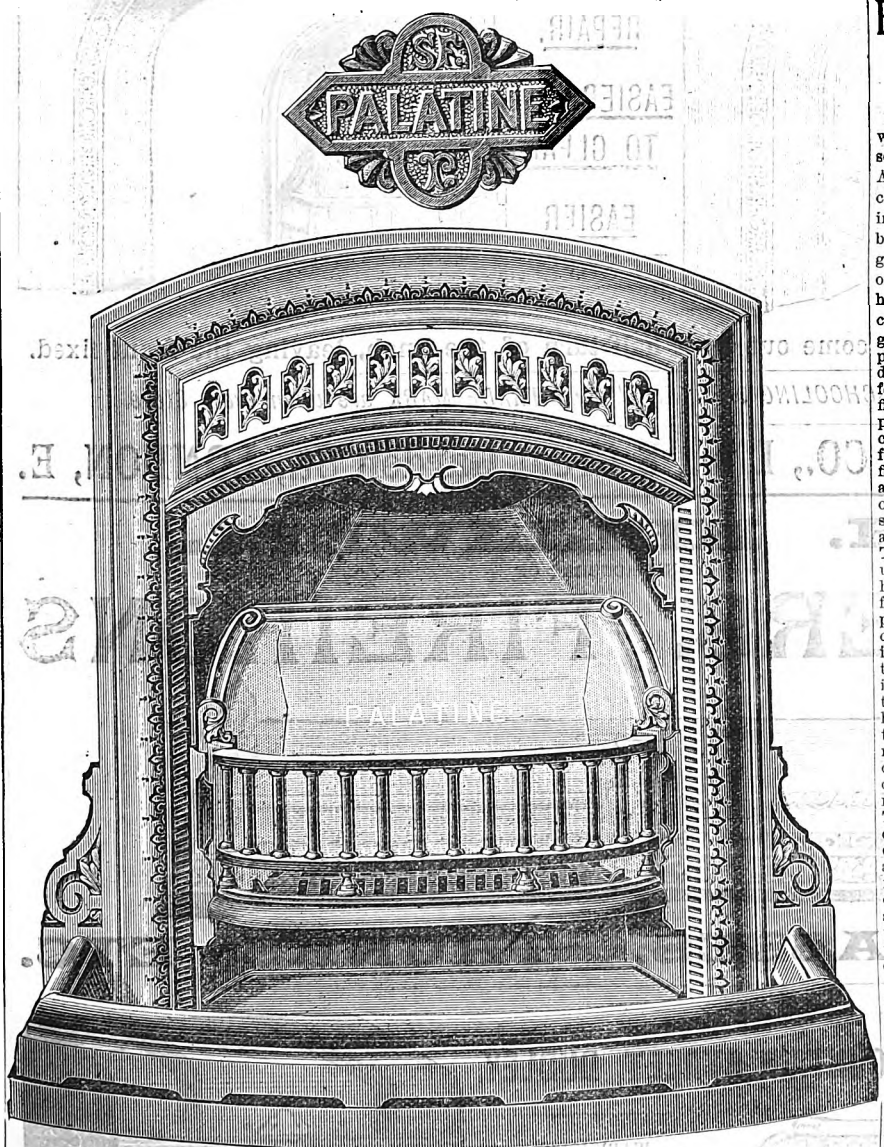
W. & A. C. RUSSELL & CO.

SCOTIA FOUNDRY,

ATHOLE STREET, PENDLETON, near MANCHESTER,

AND

41 TABERNACLE STREET, LONDON, E.C.



No. 260 "PALATINE" VENTILATING GRATE

(REGISTERED DESIGN),

FOR HEATING WAREHOUSES AND SCHOOLS.

[2] To be had through any Ironmonger.

May be had in Modified Forms to Heat other Apartments.

From "The Ironmonger."

—o—

The "Palatine" ventilating grate, of which we give a front view, and also a section (for section see IRONMONGER, August 31) showing its special form of construction, has been designed for heating warehouses and schools, and in several buildings where it has been fitted it has given every satisfaction as a grate not only elegant in design, but effective for heating large spaces, whilst it is economical in the consumption of fuel. This grate is constructed to hold a large and powerful fire. The back of the grate is double cased and fitted with gills, thus forming a heating chamber behind the fire. The fender, which is of a plain curb pattern, is designed to form a ventilating chamber, and can be arranged to admit fresh air to the hot chamber behind the fire, either from the room, drawing in the air through a series of open spaces shown on the fender bottom, or from the outside of the building by means of a fresh-air inlet placed underneath the hearth. The heat which is thrown from the fire upon the hearth is also utilised, the hearth itself being so constructed as to form a supplementary heating chamber, passing the partially warmed air into the chamber at the back of the grate, whence it finds its exit into the apartment through the ornamented perforated panel in the upper part of the grate. It will thus be seen that the whole of the heating-surface of the grate is utilised to the utmost extent. The grate itself is made extra strong throughout, and chimney-pieces, mantels, or mouldings can be fixed outside the grate when more decoration and fullness is wanted. The grate as supplied is self-fixing and complete in itself. In other departments of the foundry Messrs. Russell have made a feature of producing special designs for wholesale vendors in various classes of goods. Recently they have introduced a number of very elegant designs in theatre and ship-saloon chairs. In lavatory stands they are also doing a very considerable business, some of the designs which they have produced in these being quite a new departure in the ornamental and really high-class artistic character of these descriptions of fittings, and it may be added that there is a steadily growing public taste which is creating quite a demand for these higher class goods. They are produced in special designs for large vendors and pottery houses, so that in these cases Messrs. Russell's customers have exclusive and independent patterns for their own particular business. Many of the stands which we had an opportunity of inspecting were most tasteful in design, and fitted with elegant over-mirrors, similar in character to those which are supplied to Messrs. Russell's over-mantels. They are also arranged that they can be fitted with marble tops and used as hall tables. Gas-stoves are another speciality in which the firm's business is steadily increasing every year.

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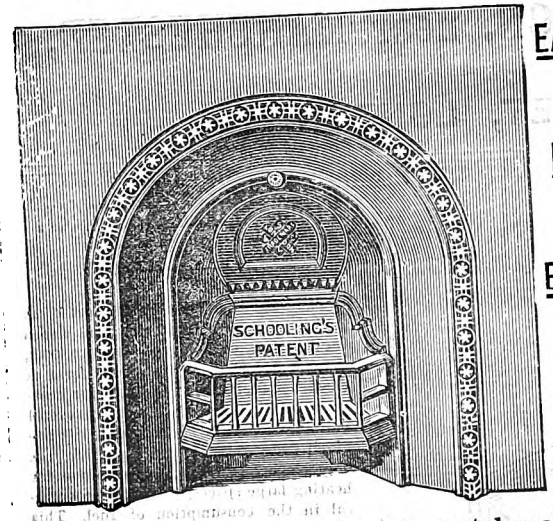
SCHOOLING'S
PATENT REGISTER STOVES

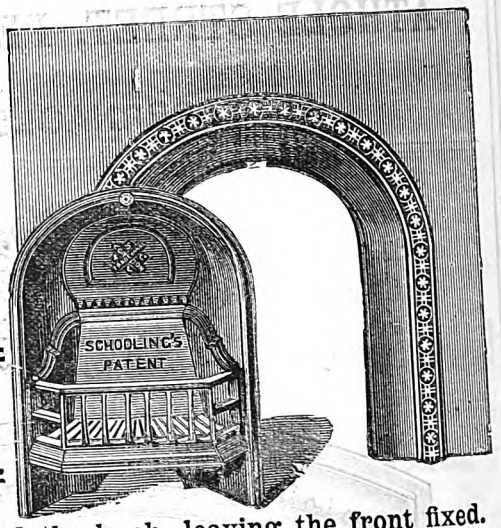


EASIER TO FIX.

EASIER TO REPAIR.

EASIER TO CLEAN.

EASIER TO SWEEP.



The back and fire part come out by a half-turn of the knob, leaving the front fixed.

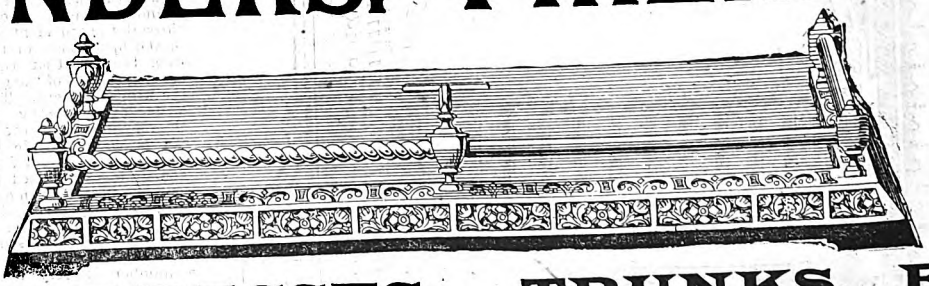
N.B.—See that "SCHOOLING'S PATENT" and TRADE MARK are upon every Stove.

SCHOOLING & CO., Lim., 8 Great Garden St., LONDON, E.

J. H. HELLIWELL,

MANUFACTURER OF

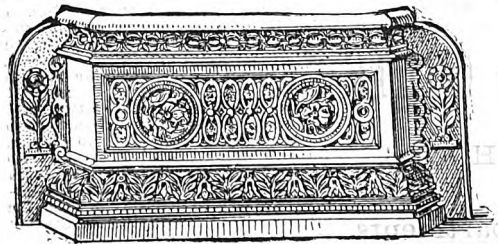
FENDERS. FIREIRONS



FIRE-BRASSES. TRUNKS, ETC.

OFFICES AND WORKS:

TUNNEL FOUNDRY, FOUNTAIN STREET, DUDLEY.

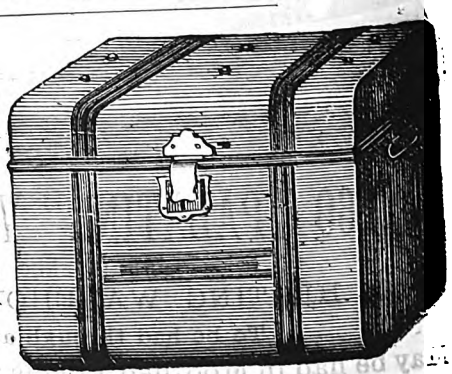


WAREHOUSE:

Oakeywell Street,

DUDLEY.

Designs and Prices on application.



Sole Export Agent—Mr M. T. KELLY, 41 Station Road, Willesden Junction, London, N.

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Gold Medal for Boilers, Paris, 1878. Gold Medal, Paris, 1879. (*The only Gold Medal ever awarded at an International Exhibition.*) Gold Medal for Safes, 1878

The Oldest and Largest Makers in the World. Medals Awarded wherever Exhibited.

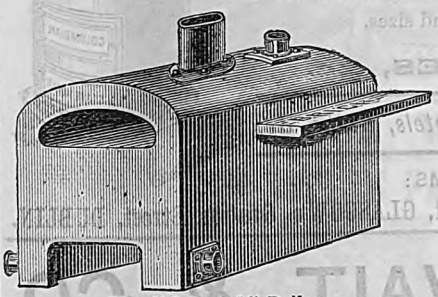
LUMBY, SON & WOOD, LTD.

PATENTEES AND MANUFACTURERS OF

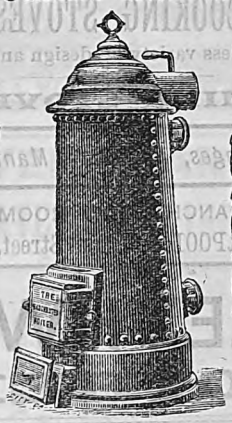
WROUGHT WELDED & RIVETED BOILERS

For Hot-water Heating Apparatus, Kitchen Ranges, &c.

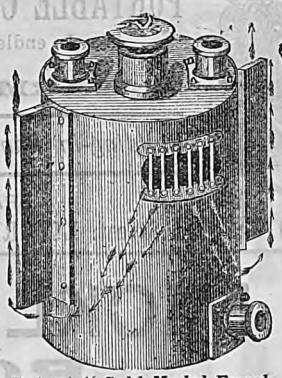
WEST GROVE BOILER AND SAFE WORKS, HALIFAX.



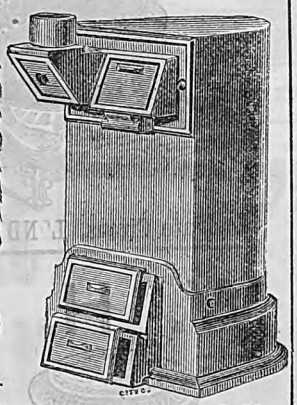
The "Colonial" Boiler.
Considered the Best Boiler of the Saddle Form in use.



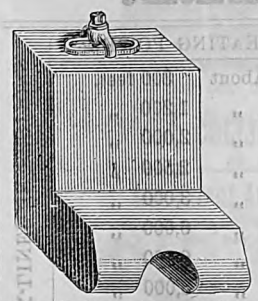
Riveted Manchester Boiler.



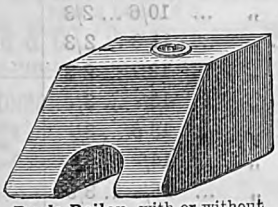
Patent "Gold Medal Excelsior" Boiler. 3,000 in use.
The most Economic and Efficient extant.



Finsbury Boiler, for Building into Wall of Greenhouse.

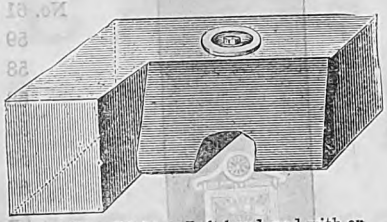


Boot Boiler, with or without Flue.



Back Boiler, with or without Flue.

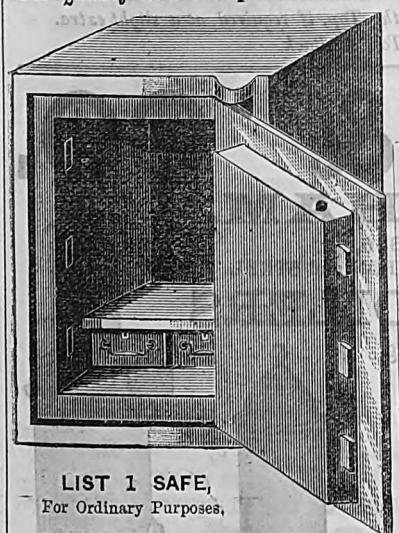
Furnace Pan.



L Boiler, Right or Left hand, and with or without Flue.

LUMBY'S SAFES

For Quality and Cheapness combined, are becoming the most Popular in the Market. All Guaranteed Fireproof.



LIST 1 SAFE,
For Ordinary Purposes,

Strong Room Doors of every description, Gates, &c.

Write for Trade Discounts.

PRICES OF LIST 1 SAFES.

Made throughout of Wrought Iron Plates, strongly secured with Angle Iron; Body Plates ¼" thick, Fireproof Chambers. ⅜" Solid Iron Door, fastened with strong Bolts thrown by Handle, Fast Bolts at back, and secured with Lumby's Patent 6-Lever Hand-made Lock. Two Keys are supplied with each Lock.

No.	Outside Sizes.			Inside Size above Drawers.			Number of Drawers.	Price.		Price Without Drawers.	
	H.	W.	D.	H.	W.	D.	IN.	£	s.	£	s.
1	20	14	14	15½	9½	8		5	0		
2	22	15	15	13½	10½	9	1	4	5	15	5	5
3	24	17	17	15	12	10	1	4	6	0	5	10
4	26	18	18	16½	13	11	2	4½	6	15	5	15
5	28	20	20	18½	15	13	2	4½	7	15	6	15
6	30	22	22	19½	16½	15	2	5	8	15	7	15
7	33	24	24	22½	18½	16	2	5	10	10	9	10
8	38	24	24	25	18	16	2	5	12	10	11	10
9	42	24	24	31	18	16	2	5	16	0	15	0

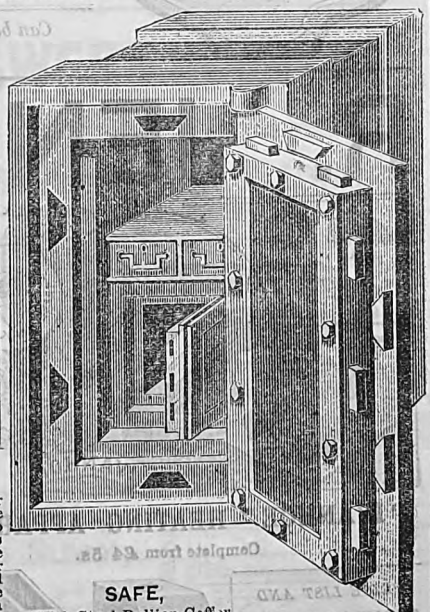
Write for Trade Discounts.

TESTIMONIAL.

HALIFAX, *May* 31, 1889.

GENTLEMEN,—We have much pleasure in adding our testimony to the high character of your Safes. The small one supplied for our private office some time ago has preserved our most valuable books and documents quite intact, although exposed for several hours to the most intense heat. Kindly send a large Safe to our temporary premises, "Miall Street Mills," and we shall probably require two or three more as soon as we have made the necessary arrangements for the continuation of our business.

Yours truly,
J. CARTER & CO.



SAFE,
With Steel Bullion Coffer.

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SMITH & WELLSTOOD, LTD.

Columbian Stove Works & Bonnybridge Foundry,

BONNYBRIDGE, SCOTLAND.

THE LARGEST WORKS IN THE WORLD

Solely devoted to this Class of Manufacture.

PORTABLE COOKING STOVES & RANGES

In endless variety of design and sizes.

WARMING STOVES, &c.

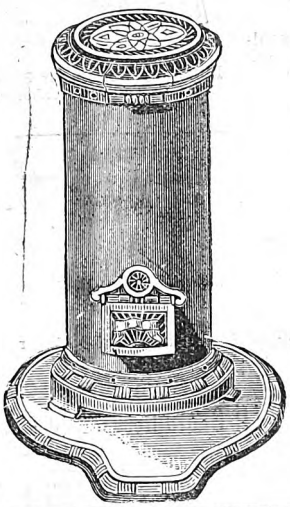
Building-in Ranges, Registers, Mantels, Baths, &c.

BRANCH SHOW ROOMS: [2]

Ludgate Circus, LONDON; Bold Street, LIVERPOOL; Dixon Street, GLASGOW; Grafton Street, DUBLIN.

W. H. MICKLETHWAIT & CO.

ROTHERHAM.



				Metal Pan extra.	HEATING POWER.
No. 61 Stove,	7 in. dia.	× 18 in. high	...	9/- ... 1/6	About 800 feet.
59 „	8 in. „	× 20 in. „	...	10/6 ... 2/3	„ 1,200 „
58 „	9 in. „	× 20½ in. „	...	11/3 ... 2/3	„ 2,000 „
68 „	9 in. „	× 23 in. „	...	12/- ... 2/3	„ 2,500 „
52 „	10 in. „	× 20 in. „	...	13/- ... 3/-	„ 3,000 „
53 „	10 in. „	× 23 in. „	...	13/6 ... 3/-	„ 6,000 „
69 „	10 in. „	× 27 in. „	...	14/- ... 3/-	„ 6,500 „
54 „	12 in. „	× 25 in. „	...	15/- ... 3/9	„ 8,000 „
55 „	12 in. „	× 30 in. „	...	16/6 ... 3/9	„ 11,000 „
56 „	14½ in. „	× 33 in. „	...	31/6 ... 5/3	„ 16,000 „
57 „	17 in. „	× 36 in. „	...	37/6 ... 7/6	„ 30,000 „

PRICK-LINED IN SECTIONS.

Can be made with a Loose Plug in the centre of the Top, if required, at a slight extra.
Made either Flue at Top or Back.

R. JENKINS & CO.

ROTHERHAM,

ESTABLISHED 1856,

Manufacturers of WROUGHT IRON and STEEL

WELDED BOILERS

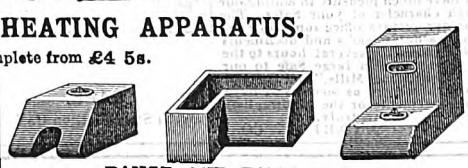
For Ranges, Hot Water Heating Apparatus, &c.

Inventors and Sole Makers of the

"IVANHOE" HEATING APPARATUS.

Complete from £4 5s.

PRICE LIST AND TERMS ON RECEIPT OF TRADE CARD.



RANGE AND BATH BOILERS.

"Amateur," No. 2,3,7. "No. 2" Pattern. "Victor."

INDEPENDENT BOILERS.

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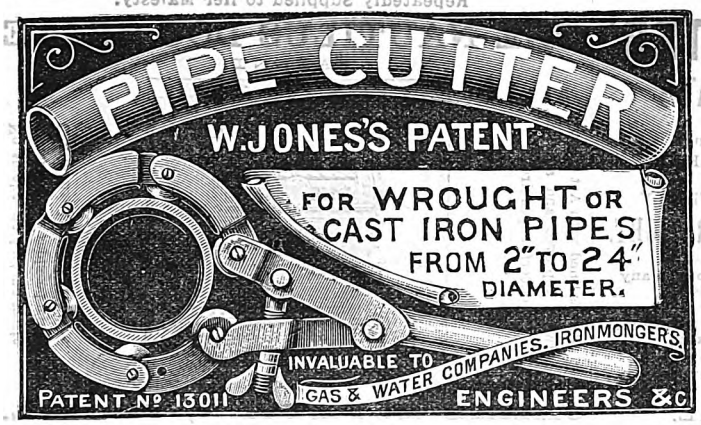


The Best "PIPE CUTTER" extant.

SPECIAL ADVANTAGES:—

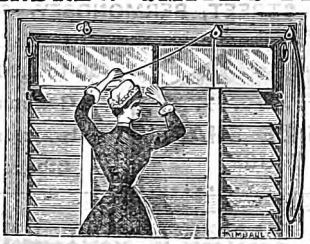
It can be altered readily by adding one link and wheel for each size.
It is capable of adjustment for all pipes 2 inches and upwards.
It can be used in confined spaces, such as channels, &c.
It adjusts itself to pipes irregular in shape.
It cuts true and with certainty.

Price List, with Special Trade Terms, free on application.

JONES & ATTWOOD.

Patentees, **STOURBRIDGE.**

HANG YOUR VENETIANS WITH ANDREW SMITH'S PATENT FITTINGS.



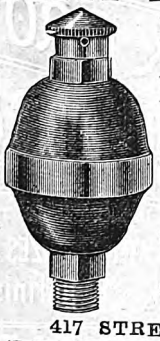
RESULT—Blinds instantaneously removable for cleaning and other purposes.

Price per set of 3 Pulley Wheels, 2 Brackets and 2 Caps, 2/6.

SMITH, COLLIER & CO., Patentees and Manufacturers,
29 ALDERMANBURY, LONDON, E.C.

The Patent Automatic Frictionless Opening & Closing

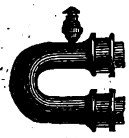
AIR-ESCAPE TAP



With or without Safety Valve

SPECIALLY DESIGNED FOR

HOT-WATER HEATING COILS PIPES.



Domestic Hot-Water Arrangements.

Easily adapted for expelling Air from Steam Apparatus.

SEVERAL THOUSANDS IN USE.

Used by the Largest Hot-Water Engineers.
See their Testimonials.

THOS C. OLNEY (SOLE LICENSEE), Engineer,
417 STRETFORD ROAD, MANCHESTER.

"UREKA" INSTANTANEOUS BATH HEATER, Without Gas.

SWEET BROTHERS

(PATENTEES),

102 Hampstead Road, LONDON, N.W.

THE AONE FUEL ECONOMISER

OR ADJUSTABLE FALSE BOTTOM. (Patent applied for.)

Made in **HUNDREDS OF SIZES** to suit all **RANGES** and **STOVES.**

SAVES HALF THE COALS!

NO FIXING REQUIRED.

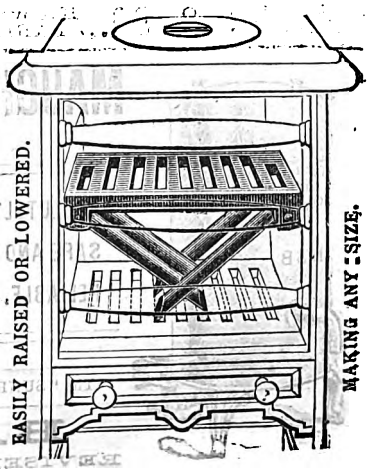
GROSS PRICE,
WITH LIFTING HOOK,

From 2/6 each.

LIBERAL TERMS TO THE TRADE.

THE AONE COMPANY,
181 Queen Victoria Street,
LONDON, E.C.

Show Cards and Circulars (with own name printed) supplied free of charge.



EASILY RAISED OR LOWERED.

MAKING ANY SIZE.

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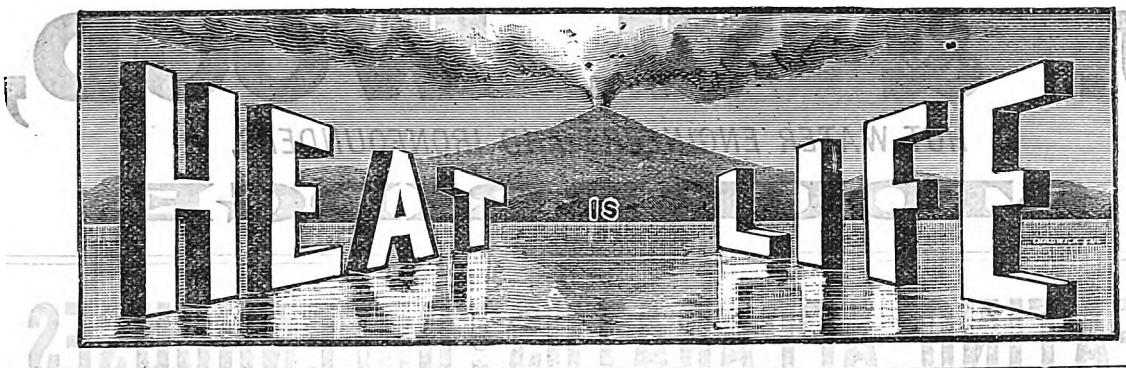


TELEGRAMS: "HEAT," STOURBRIDGE.

OUR HOT-WATER SPECIALITIES

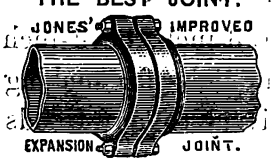
TRADE HEAT MARK

TELEGRAMS: "HEAT," STOURBRIDGE.

HEATING APPARATUS.

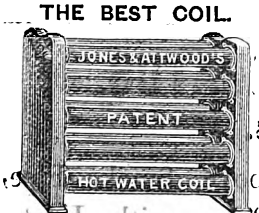
THE BEST JOINT.

JONES' IMPROVED



EXPANSION JOINT.

THE BEST COIL.

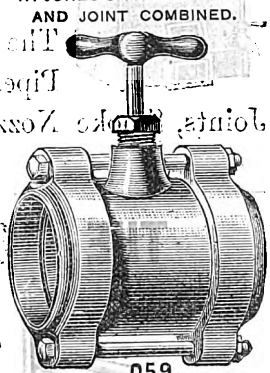


MEDALS AWARDED, 1875 & 1881.

ONCE USED, ALWAYS USED.

SIMPLE, DURABLE, NEAT, CHEAP.

W. JONES'S PATENT VALVE AND JOINT COMBINED.



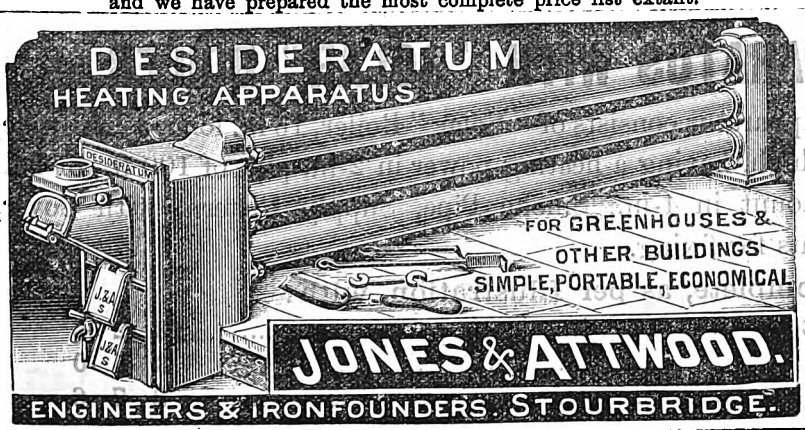
REFUSE IMITATIONS.

059

HAVE GAINED UNIVERSAL REPUTE.

"DESIDERATUM" APPARATUS.

This Apparatus is acknowledged to have superseded all others in the market, and we have prepared the most complete price list extant.



CATALOGUE

(FREE)

Of Boilers, Pipes, Pipe Cutters, Valves, Expansion Joints, Coils, Coil Cases, Baths, Cisterns, Tanks, &c.

W. JONES'S TREATISE, "HEATING by HOT-WATER" (as appeared in IRONMONGER), Bound in cloth, Price 2s.

ESTIMATES

For Heating every description of Buildings, either high or low pressure system.

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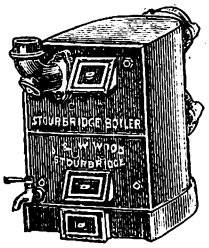
J. & W. WOOD,

HOT-WATER ENGINEERS AND IRONFOUNDERS,

STOURBRIDGE.

HEATING APPARATUS FOR GREENHOUSES, &c.

THE "STOURBRIDGE" BOILER.



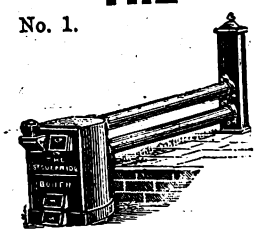
Size of Boiler, 21 in. high, 14 in. wide, 12 in. deep.
Heating Power in 2-inch Pipes, 150 feet, or half the amount in 4-inch.

PRICE £2 10 0

The price includes Two Sockets, for either 2-inch, 3-inch, or 4-inch Pipes cast on Boiler, Flanges, Indiarubber Rings and Bolts for making Joints, Smoke Nozzle, Damper, Fire Bars, and Ash Pit, and delivery to any Goods Station in England or Wales.

THE "STOURBRIDGE" HEATING APPARATUS.

No. 1.



No. 1 APPARATUS.

Consists of Stourbridge Boiler, as described above, Smoke Pipe, Supply Cistern, with Cover, Two 4-inch Pipes, with Joints, for fixing.

Price Complete, as per Illustration, with:—

Two 4 inch Pipes, 6 feet long	£3 16 0
Two 4 „ „ 7½ „ „	3 18 0
Two 4 „ „ 9 „ „	4 0 0

HEATING APPARATUS WITH "SOLAR" BOILER.

This Apparatus consists of "Solar" Boiler, 16 in. long, 12 in. wide, 16 in. high, having a heating power in 2-in. pipe of 100 ft., or half the amount in 4-in., Smoke Pipe, Supply Cistern, with Cover, Two 4-inch Pipes, with Joints for fixing.

Price Complete, as per Illustration, with:—

Two 4 inch Pipes, 6 feet	£3 2 6
Two 4 „ „ 7½ „	3 5 0
Two 4 „ „ 9 „	3 7 6

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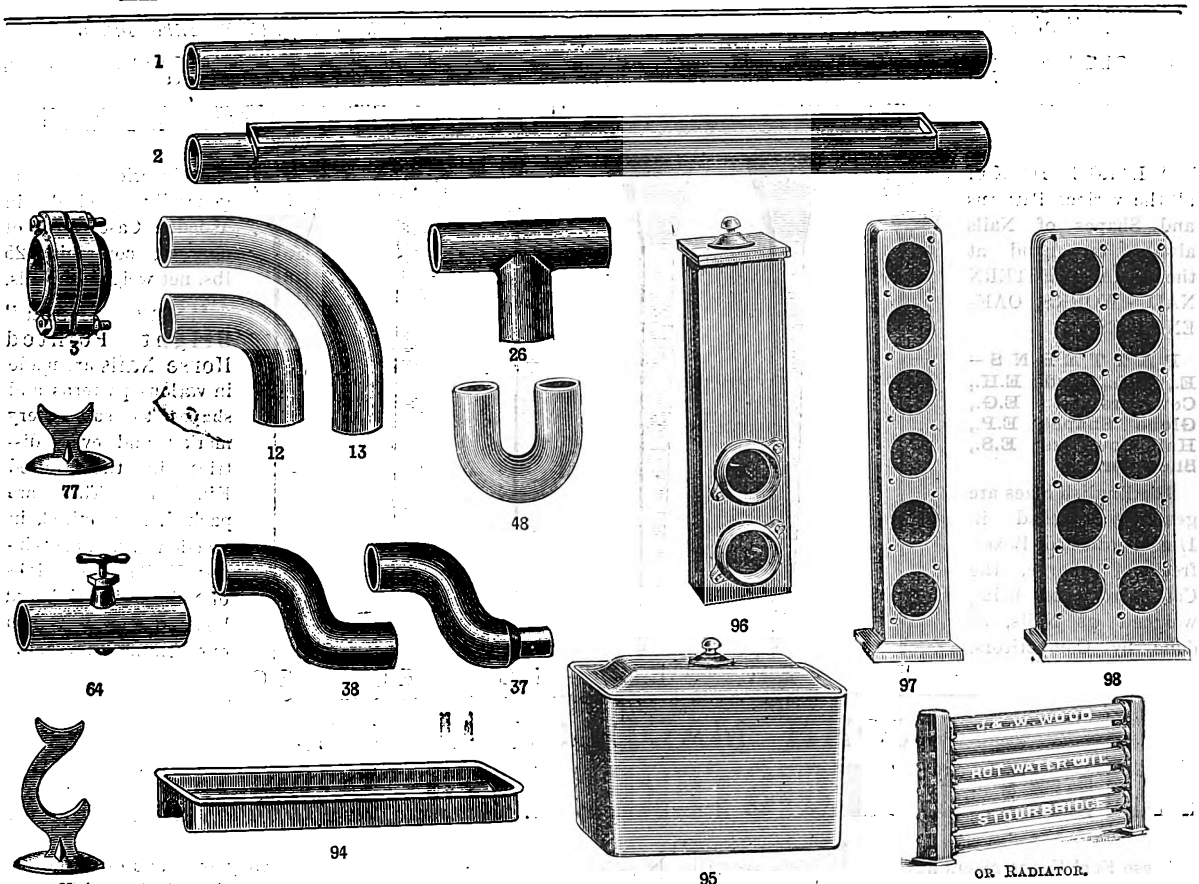
SELECTION FROM OUR ILLUSTRATED CATALOGUE OF

HOT-WATER PIPES & CONNECTIONS,

WITH IMPROVED EXPANSION JOINTS.



OR RADIATOR.

PRICES AT THESE WORKS.

No.		2	3	4	Inch.
		s. d.	s. d.	s. d.	
1	Pipe, 9-ft. long	—	3 10	5 3	Each.
„	Do. 7½-ft. long	2 6	3 3	4 6	„
„	Do. 6-ft. long	1 9	2 7	3 7	„
2	Trough Pipe, 9ft. long	—	11 6	13 9	„
3	Joint, complete, with Rubbers and Pins	0 10	1 1	1 4	„
12	Elbow, ordinary	0 8	0 10	1 0	„
13	Do., outside, for two rows	1 4	2 0	2 5	„
26	Tee Pipe	0 11	1 3	1 6	„
36	S Pipe, 7-in. projection	1 3	2 0	2 10	„
37	Do. Diminishing	1 5	2 2	3 2	„
48	Syphon	0 11	1 3	1 7	„
64	Valve	7 0	8 0	9 0	„
77	Pipe Stand	0 1½	0 2	0 2	„
81	Do. do.	0 3	0 4	0 5	„
94	Loose Trough	—	2 0	2 6	„
95	Cistern and Lid, 4 gallons	5 0	—	—	„
96	Expansion Box and Lid	8 0	8 0	8 0	„
97	Coil End, Single Row, complete, with Flanges, Rubbers, and Pins	1 2	1 9	2 3	per hole
98	Do. Double do. do. do. do.	1 2	1 9	2 3	„

For Prices of other Connections see Complete List, free on application.

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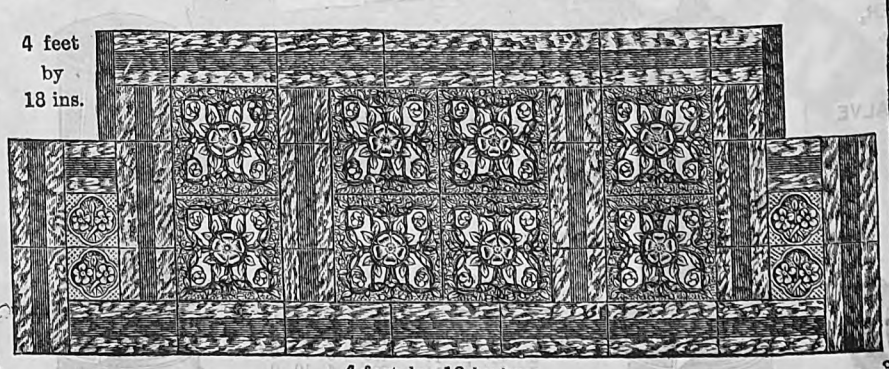

4 feet by 18 inches.

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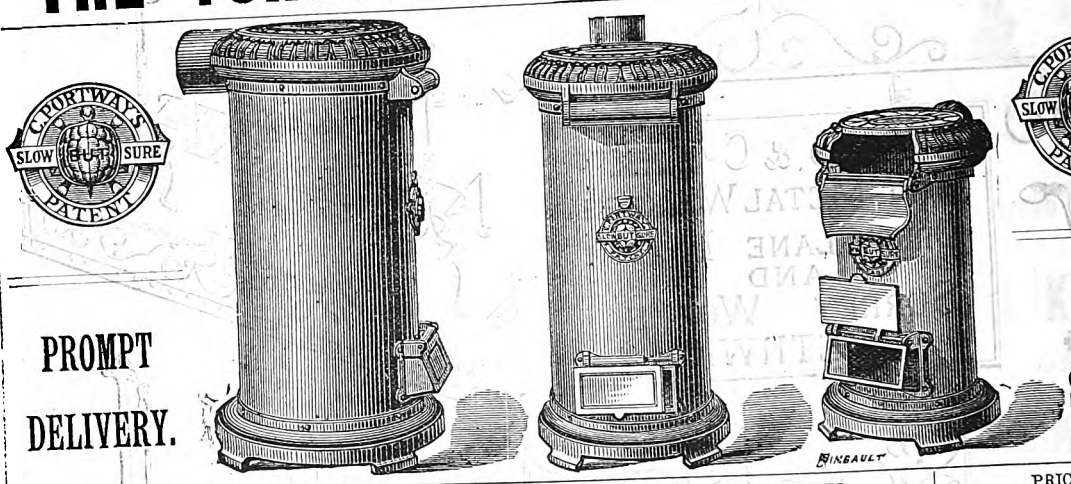

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No. 2	25 " 10 "	" 6,000 "	1 4 0
No. 3	30 " 12 "	" 10,000 "	1 15 0
No. 4	32 " 14 "	" 15,000 "	2 10 0
No. 5	34 " 16 "	" 25,000 "	4 0 0
No. 6	40 " 18 "	" 40,000 "	5 5 0
No. 7	45 " 21 "	" 70,000 "	8 0 0
No. 8	50 " 24 "	" 120,000 "	12 0 0

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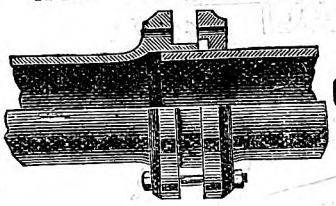

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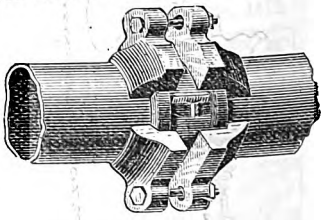

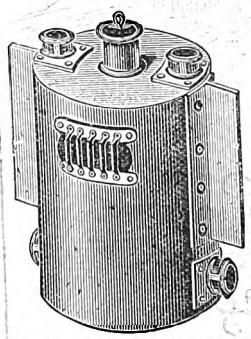

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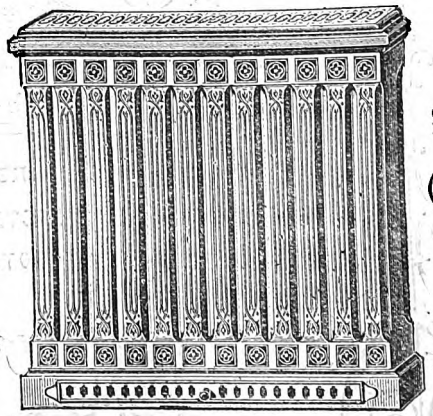

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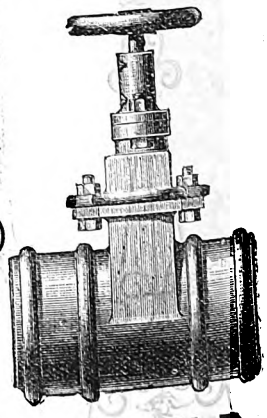

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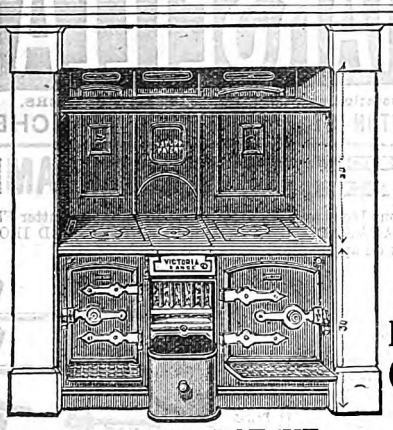

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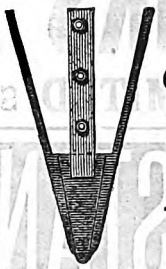

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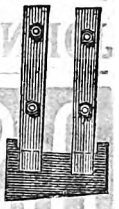

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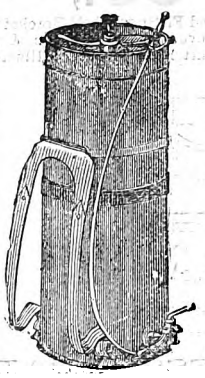

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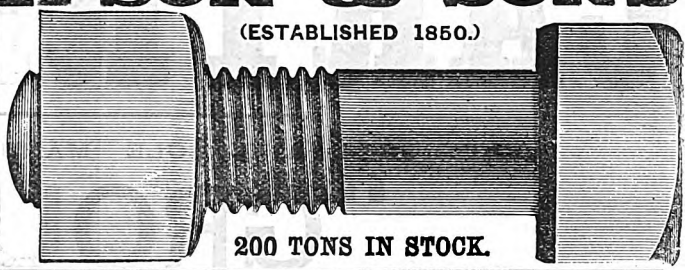

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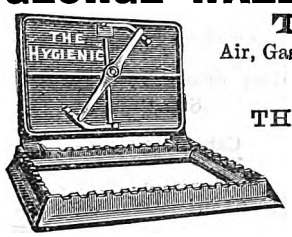

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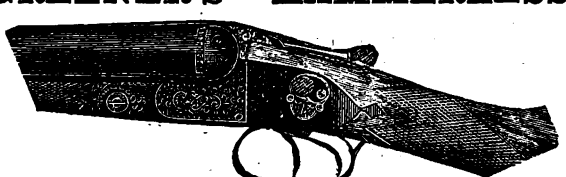

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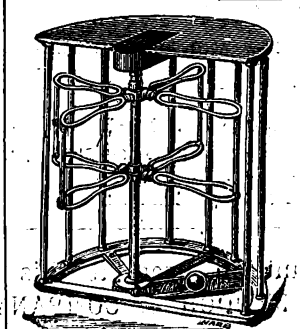

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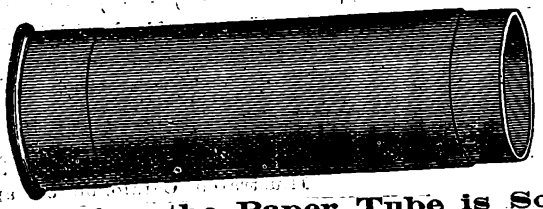

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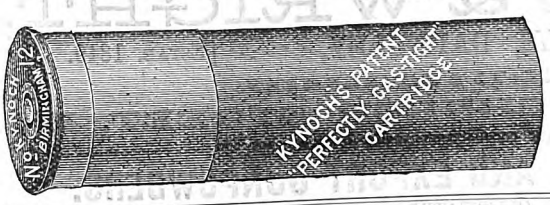

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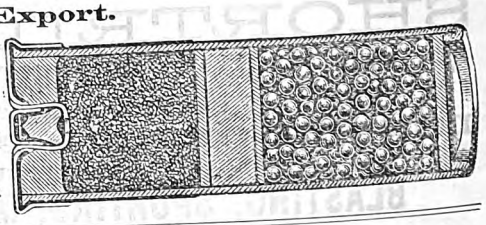

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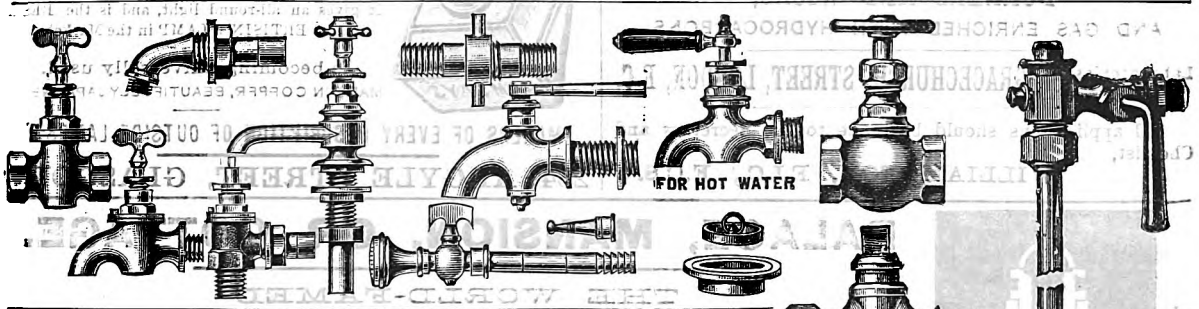

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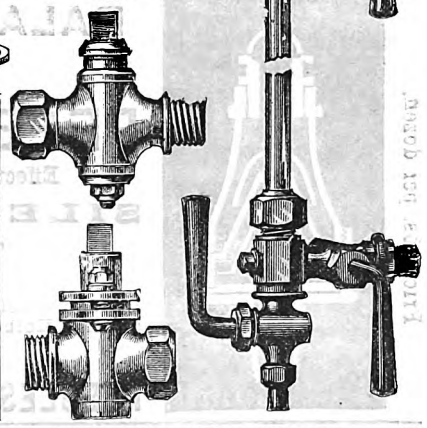

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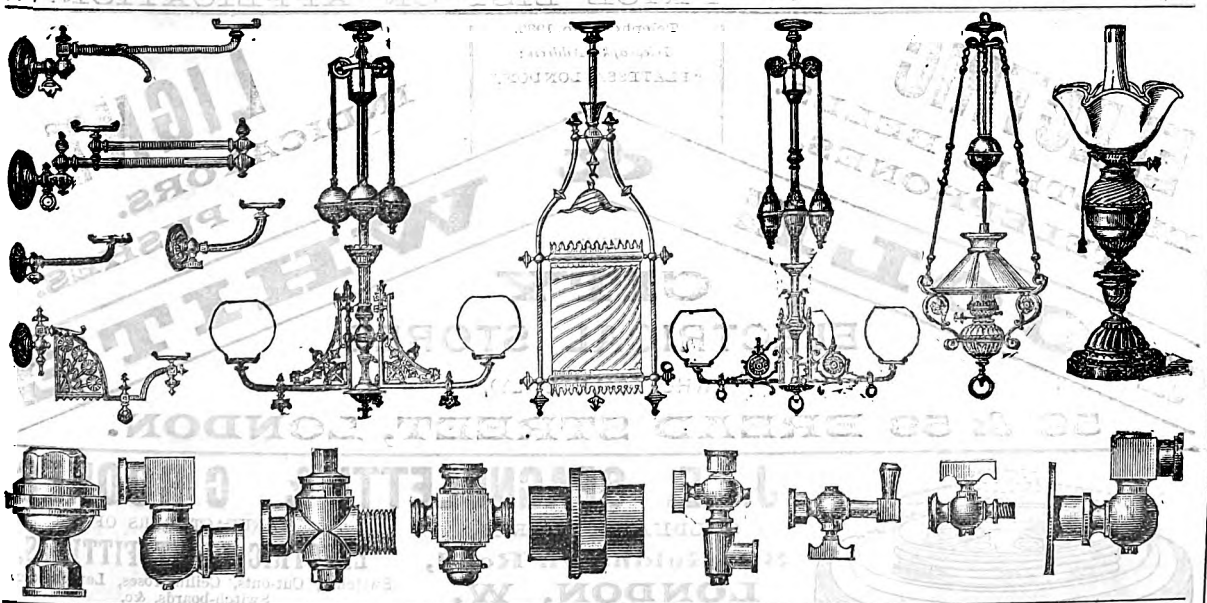

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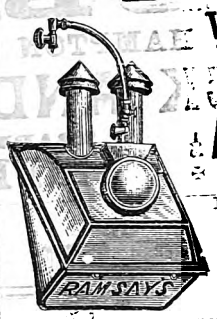

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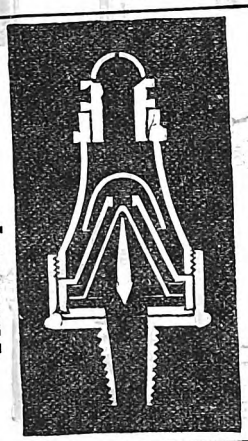

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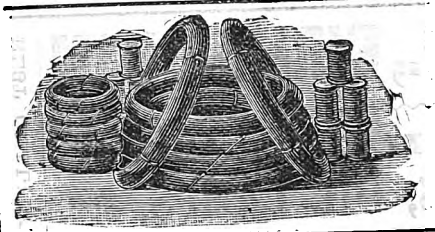

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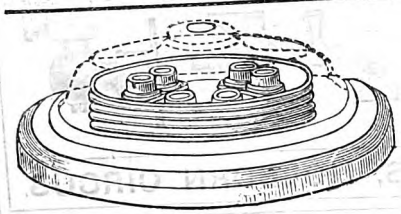

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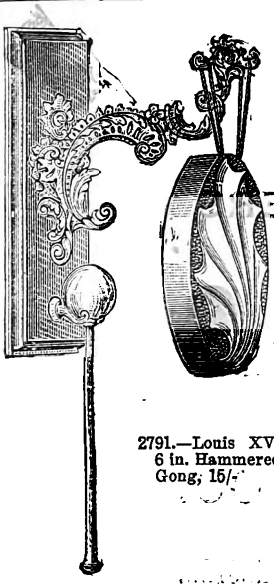
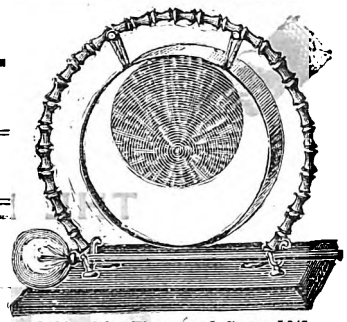


2791.—Louis XV. 6 in. Hammered Gong, 15/-



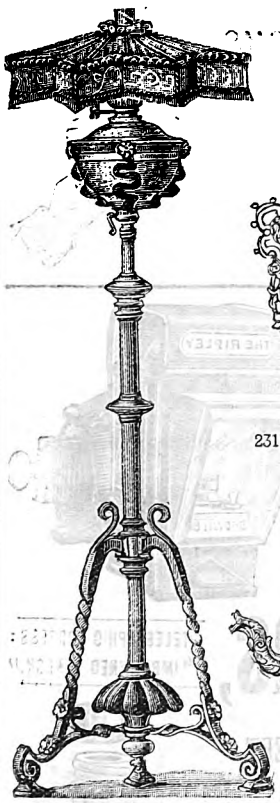
2614.—6-in. Hammered Gong, 10/6. Voce's Patent Tube.

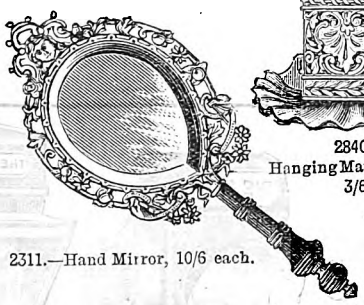
2404. 7½-in. high, 10/- pair.

2793.—Louis XV. Table Gong, 7-in. diameter, 27/6 each.

2008. 2/6 pair.

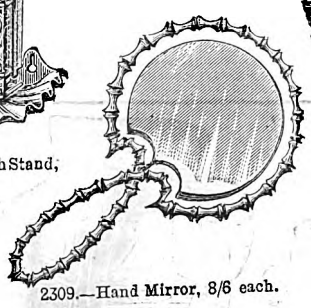
2492.—Iron Stand with Copper Kettle, 11/6 each.
2751. Brass Stand, 15/- each.





2311.—Hand Mirror, 10/6 each.

2840. Hanging Match Stand, 3/6.



2309.—Hand Mirror, 8/6 each.

2703.—Iron and Copper Floor Lamp, with Patent Telescopic Action for Fixing, 63/- each.

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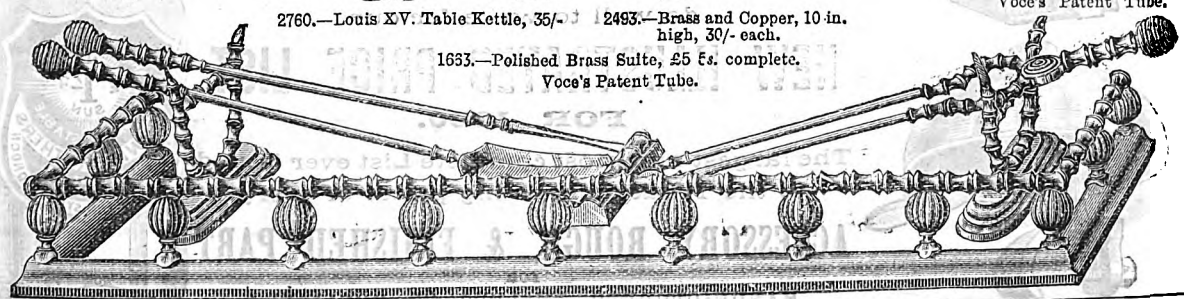
2493.—Brass and Copper, 10 in. high, 30/- each.

2491.—Floor Kettle, Copper and Brass, 50/- each. Voce's Patent Tube.

1633.—Polished Brass Suite, £5 5s. complete. Voce's Patent Tube.



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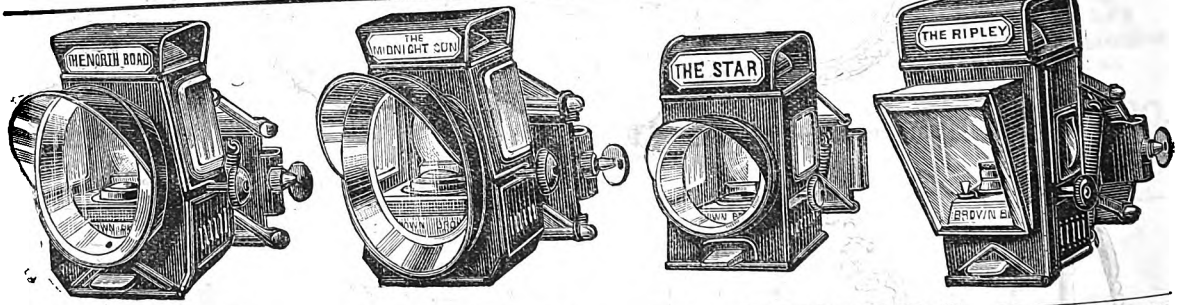

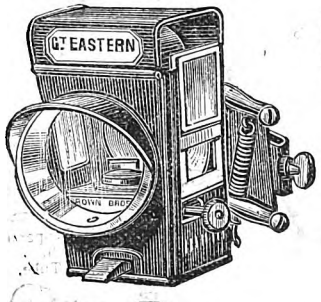

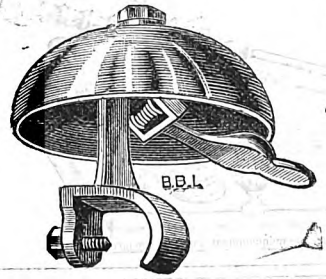

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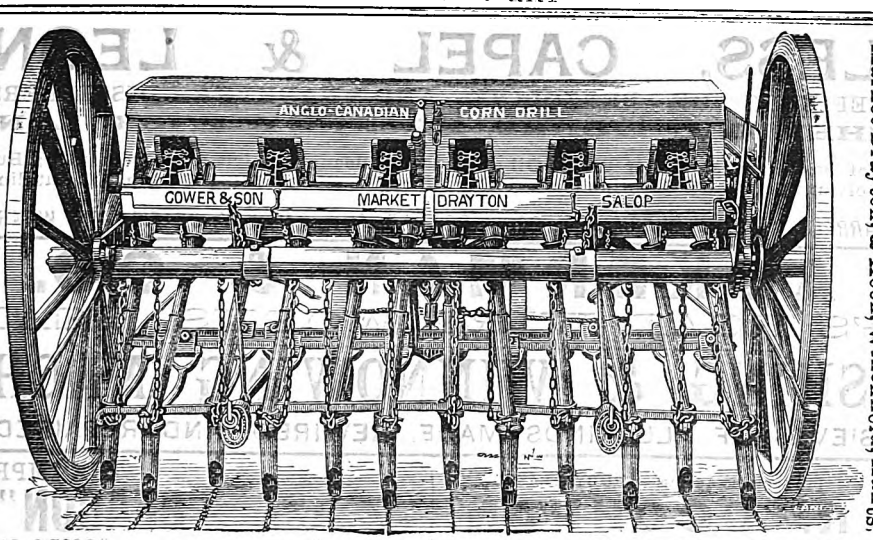

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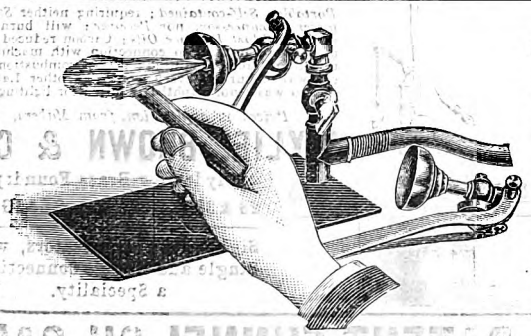

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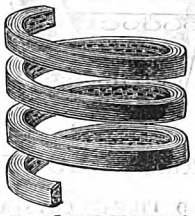

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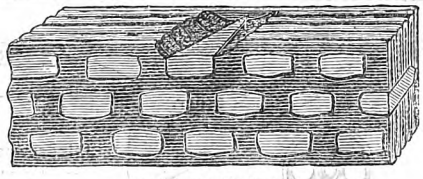
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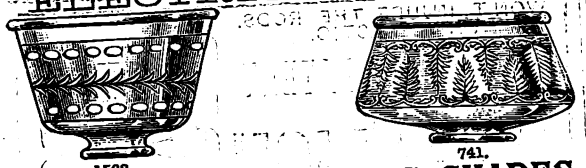

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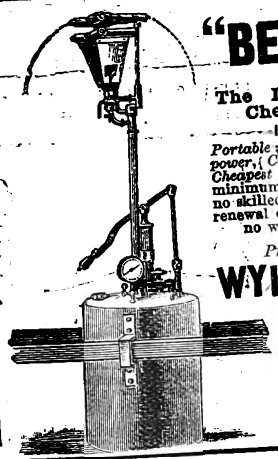

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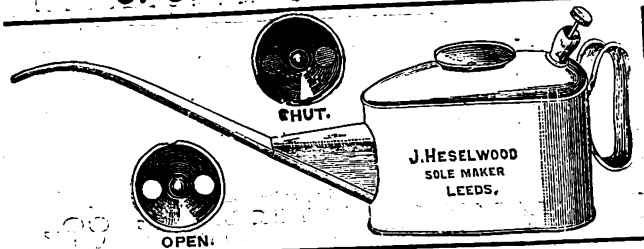

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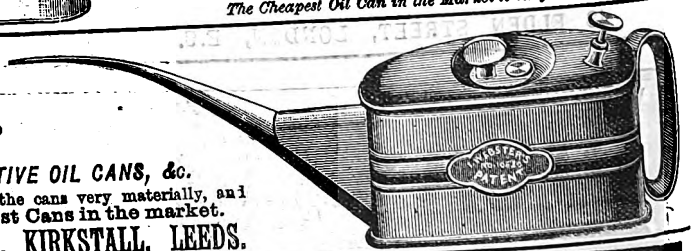

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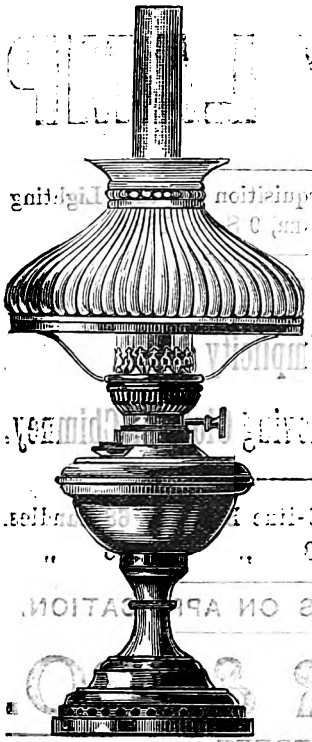

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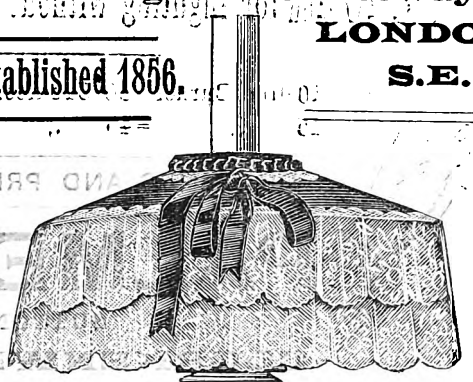

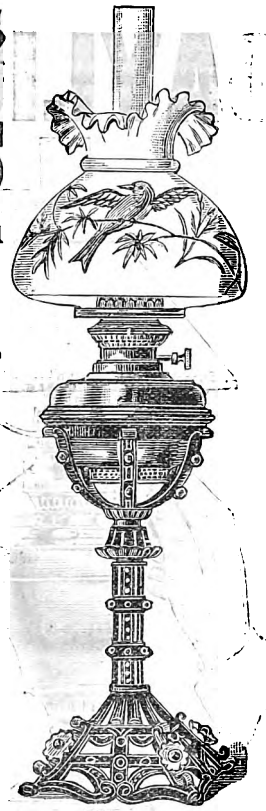

307

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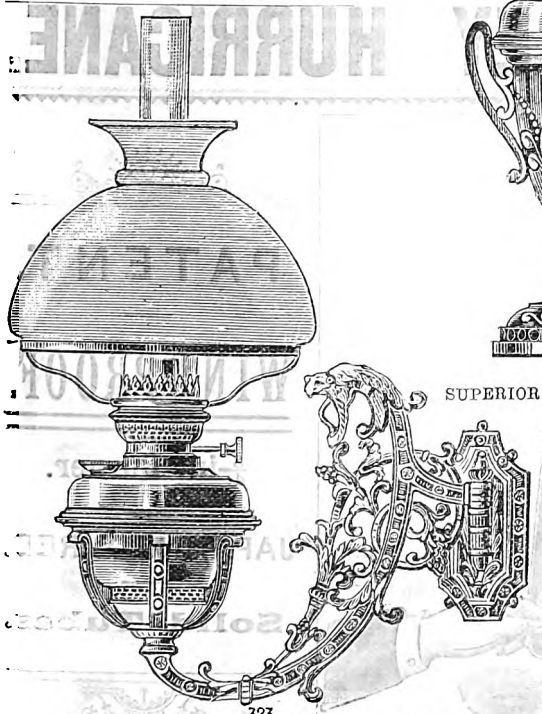
Either of above may be had with No. 24, 45-candle power Burner, 2/6 each extra.



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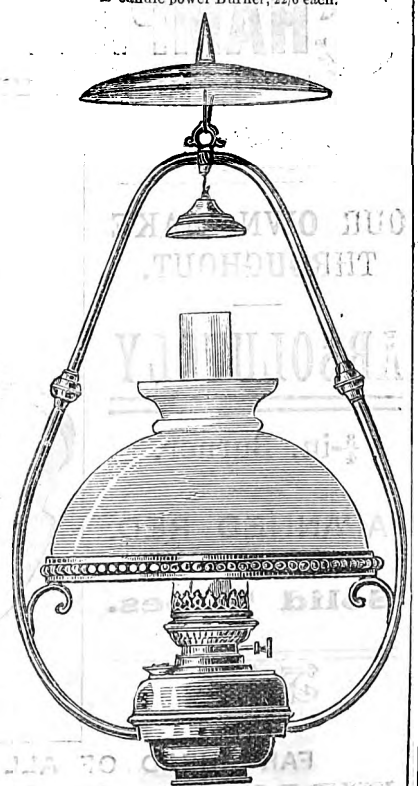

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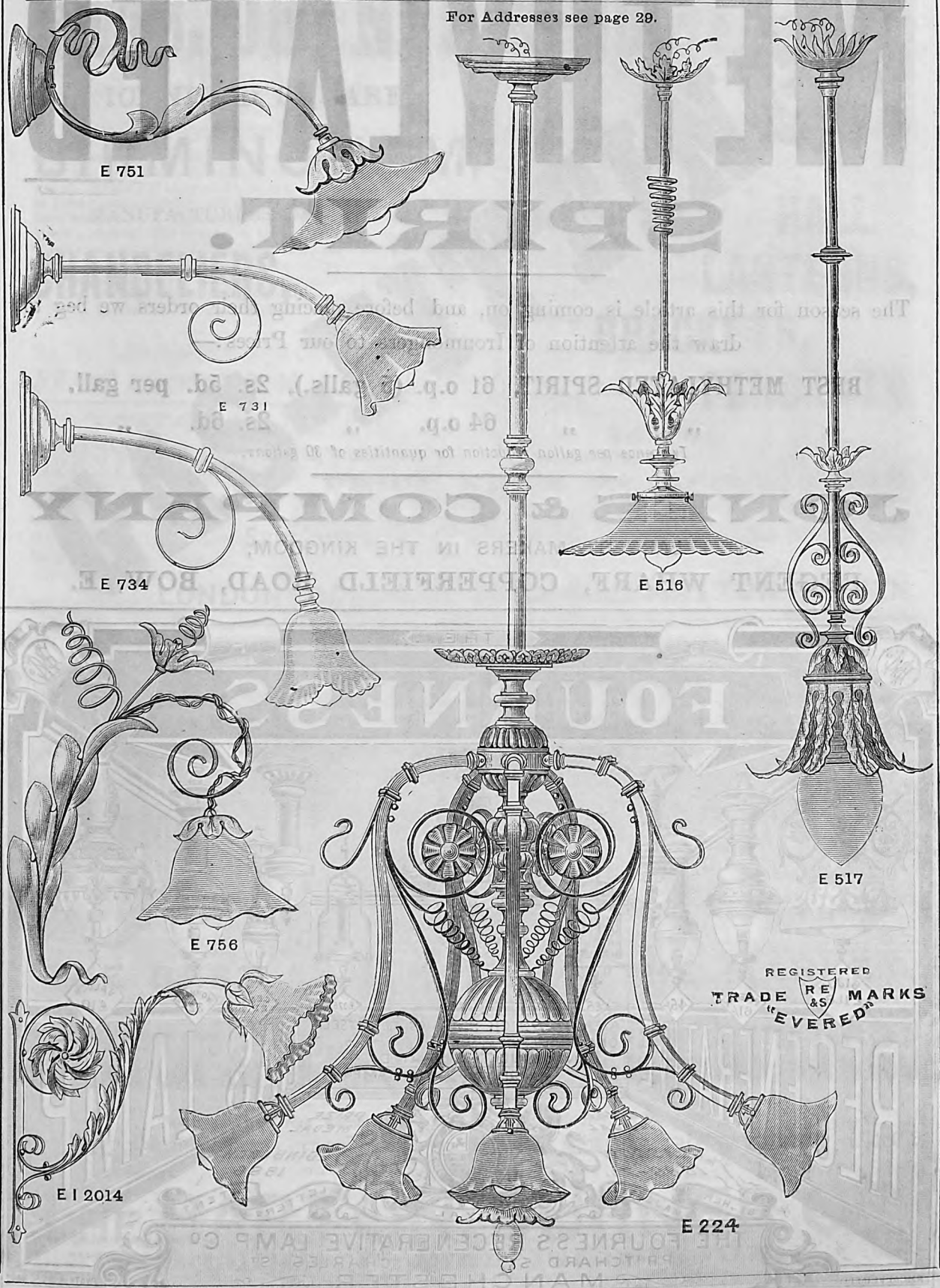

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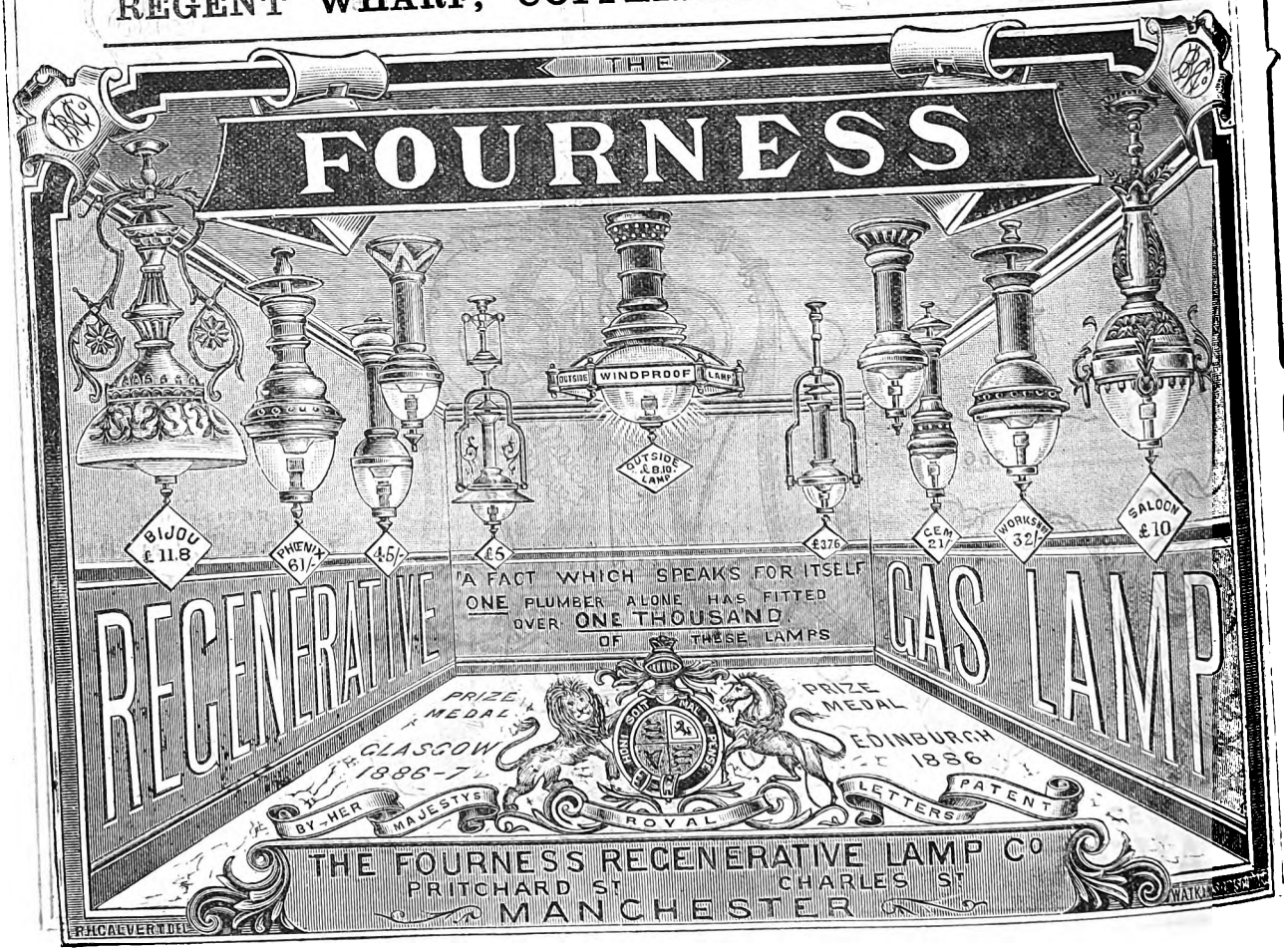

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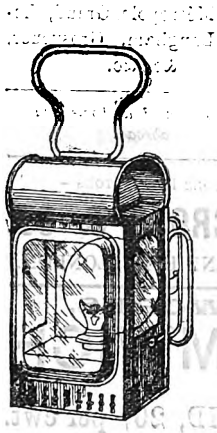

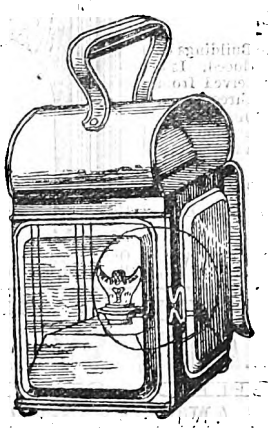

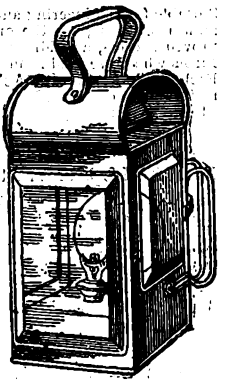

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Hydrometer and Saccharometer Tubing
Ornamental and Coloured Tubing
Coloured and Flint Cane, &c., &c.

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NEW AND IMPROVED SYSTEM.

THE FOLLOWING IMPROVEMENTS HAVE BEEN INTRODUCED:—

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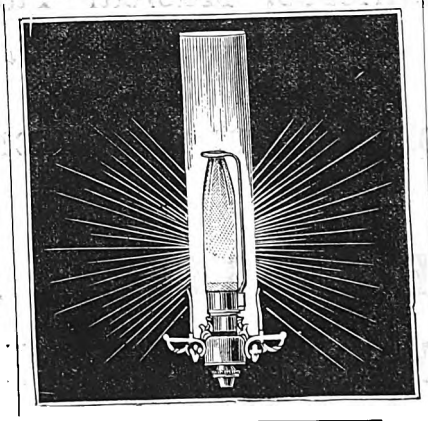
2.—The Mantle is supported by a clay, instead of an iron, ring, and the danger of dropping away from the support is obviated.



3.—By using STRAIGHT CHIMNEYS the risk of breakage is avoided.

4.—Mantles as now supplied can be kept in stock any time with perfect safety.

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ILLUMINATION LAMPS

FOR DECORATIVE PURPOSES.

EFFECTIVELY DISPLAYED IN SHOP WINDOWS,

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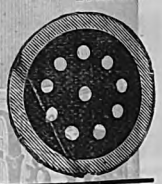

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BINGLEY WORKS

BROAD STREET,

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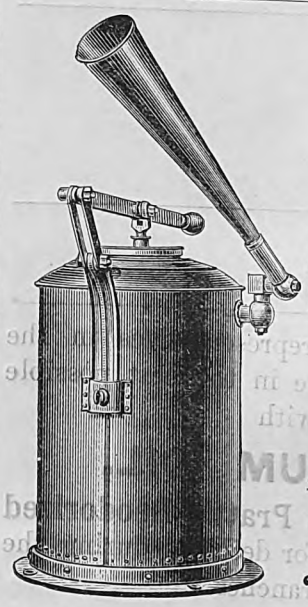

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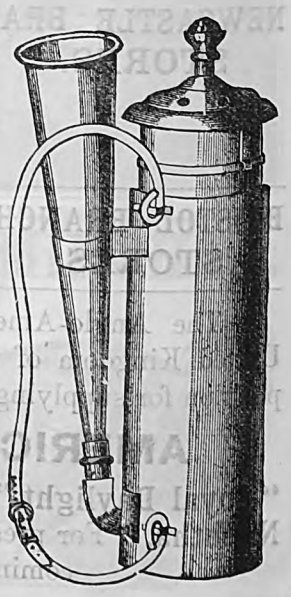

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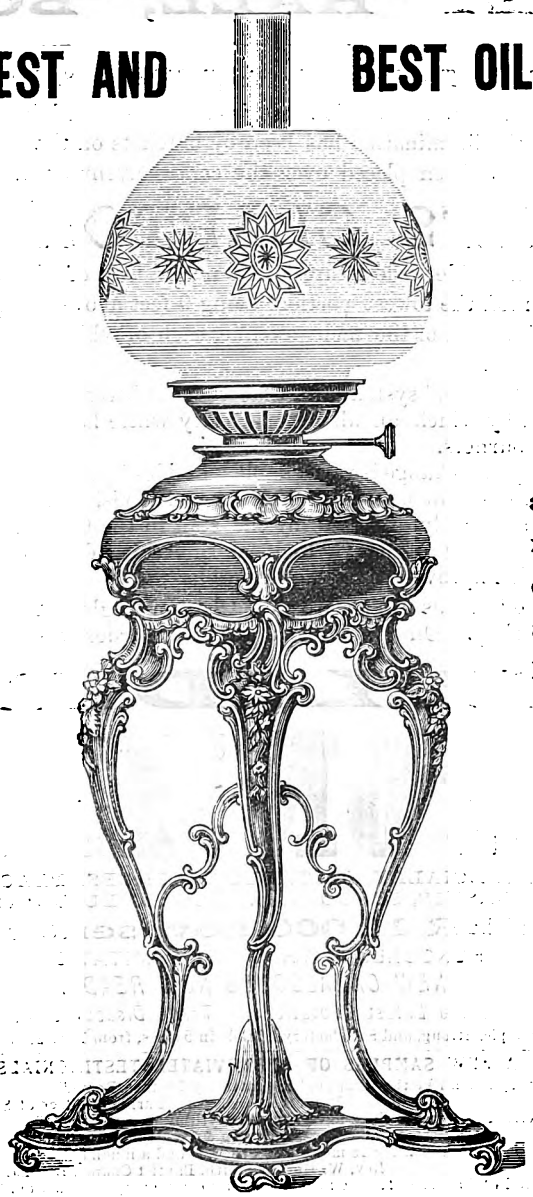

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The Burners are made in four sizes, viz., 30, 50, 65, and 100 candle power respectively, and are thus equally adapted for domestic and church or other public lighting.

They are economic in use, easy to fill, trim, light, or extinguish.

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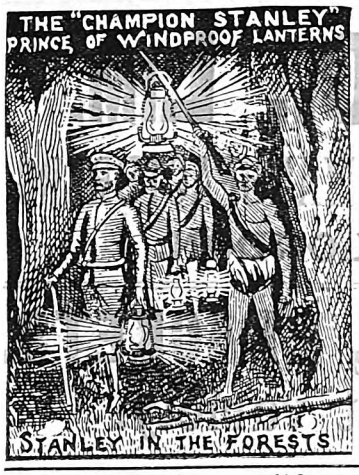

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No. 700.—Japanned Red, 22/; Bronzed, 24/ doz.

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Suit any height of ceiling. No dangerous Balance Weights.

Made in 4 sizes, with burners, as priced below.

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The 50 and 100 candle-power lamps have the most Simple and Effective Wick-arrangement Extant.

Full Lines of these Central Air Lamps.

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ESTABLISHED 1858.

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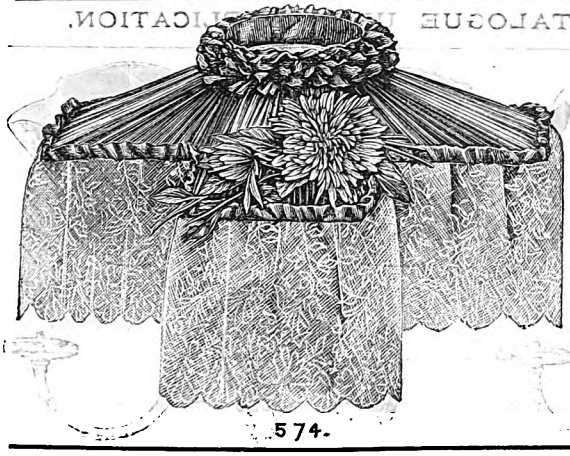
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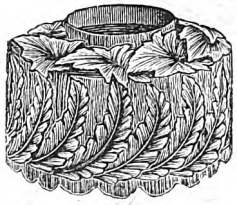
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Special Gas Engine Oil, strongly recommended by Messrs. Crossley Bros., Lim.

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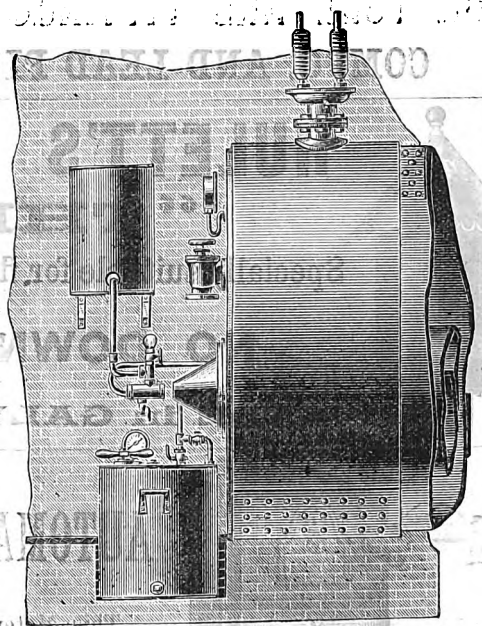

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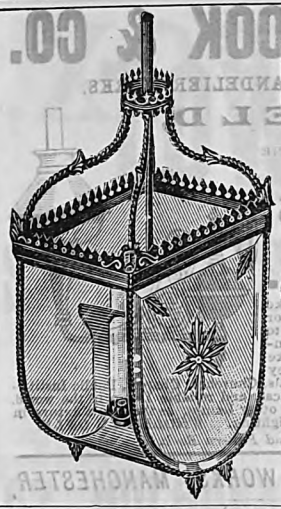

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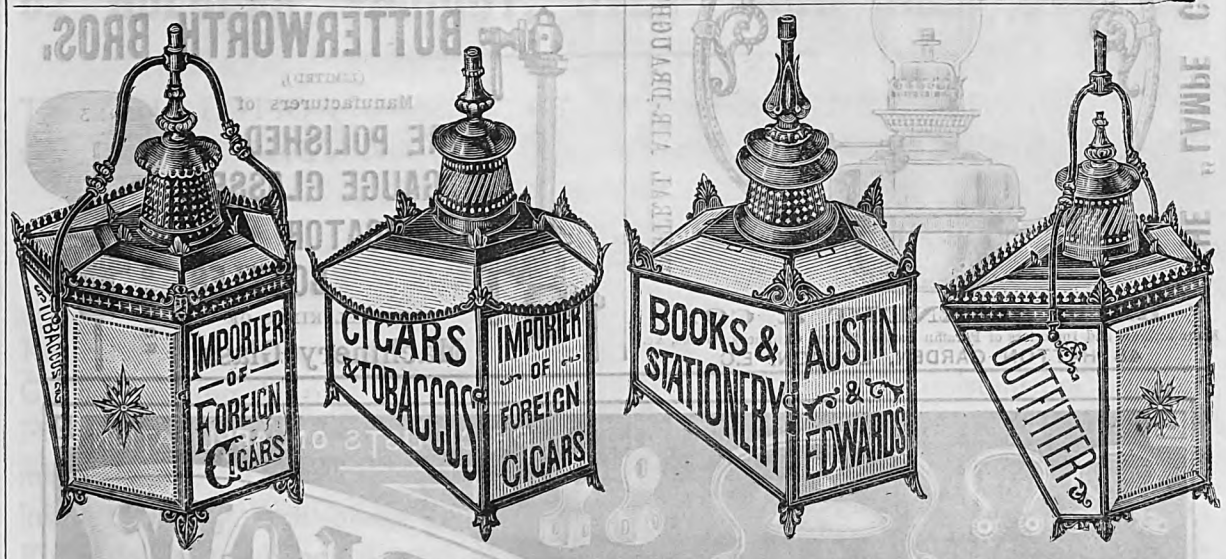
GAS LAMPS

OF EVERY DESCRIPTION FOR THE TRADE.

ORNAMENTAL IRON BRACKETS, LAMP POSTS, &c.

LOBBY LAMPS of Improved Design,

With Bevelled Plate and Written Panes, &c.



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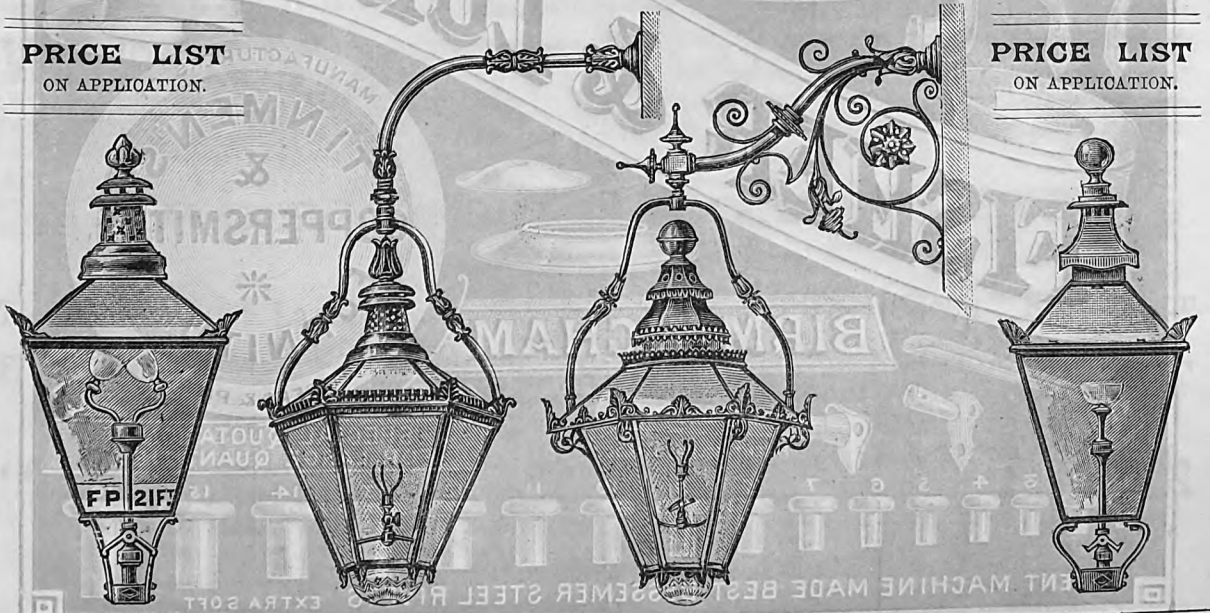

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Made in 50 and 100 Candle Power.

For House, Shop, and Village Lighting.

In Floor, Table, Harp, and Suspension, Lamps.

In Brackets, Pillars, and Outside Lamps.

THE "LAMPE CAROLUS."

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WEST RIDING OIL CHANDELIER WORKS.
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Manufacturers of the
PATENT "SAFETY" [1]
OIL CHANDELIERS
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OIL LAMPS.

They are fitted to the ceiling or walls like ordinary Gas Fittings, and can be raised or lowered at pleasure, and give a light equal to a No. 5 gas-burner, requiring little or no attention. Our Lamps when lighted are more like gas than any other Lamp in the market. They are highly recommended for lighting Hospitals, Churches, Chapels, Public Institutions, &c. The best, cheapest, most economical, and reliable Lamp in the world. There is no danger of upsetting as in most other Lamps, as they are a fixture in the room, and are easily trimmed ready for lighting. *WHOLESALE ONLY.*

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BUTTERWORTH BROS.
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Manufacturers of
FIRE POLISHED GAUGE GLASSES,
LUBRICATOR BOTTLES,
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SPECIAL QUOTATIONS FOR LARGE QUANTITIES

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PATENT MACHINE MADE BEST BESSEMER STEEL RIVETS EXTRA SOFT

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SPECIAL SHOW of ARTISTIC METAL WORK

FOR THE COMING SEASON IS NOW OPEN,

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The COLLECTION comprises a large number of NEW DESIGNS and a variety of DISTINCT NOVELTIES, including an important series of Specimens in the

Louis XV. Style of Art.

Realising the growing popularity of this most pleasing period of Art, TOWNSHEND & Co. have during the past twelve months, at great cost, with the assistance of talented French Artists, produced a number of beautiful articles in all departments of their manufactures. These are offered at prices within reach of the middle classes, and lower than any such goods ever before put upon the Market. **The Louis XV. Fireside Suite, Floor Lamp, Floor Kettle, Gongs, &c., are splendid specimens of Art Brasswork,** and are certain to command a large sale.

THE SPECIMENS OF

WROUGHT-IRON & COPPER WORK

In all departments are specially worth attention.

IMPORTANT NOVELTIES

ARE OFFERED IN

Telescopic Floor Lamps, Table Lamps, Gongs, "Five-o'-Clock" Kettles for Floor and Table, Jardinieres, Musical Tubes, Fireside Suites, Fire Screens,

AND IN

"Whangee" Art Brass Work

(VOCE'S PATENT)

A large number of very taking New Designs are exhibited.

SEE PAGES 131 and 143.

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FRANCIS F. FOX,

PETROLEUM IMPORTER,

BRISTOL,

And Petroleum Stores—SHARPNESS, GLOUCESTER, AND BIRMINGHAM.

PETROLEUM, PARAFFIN, BENZOLINE, BENZINE, AND GAZOLINE.

NATURAL & REFINED MINERAL OILS.

SOLE PROPRIETOR OF

LUX BRISTOLIENSIS,

THE MOST PERFECT ILLUMINATING OIL.
White as water, quite Sweet, and Guaranteed Safe.

WHOLESALE AGENT for ASPINALL'S ENAMEL

Oils and Colours of all descriptions.

MIXED PAINT IN 1, 2, 4, and 7 lb. TINS.

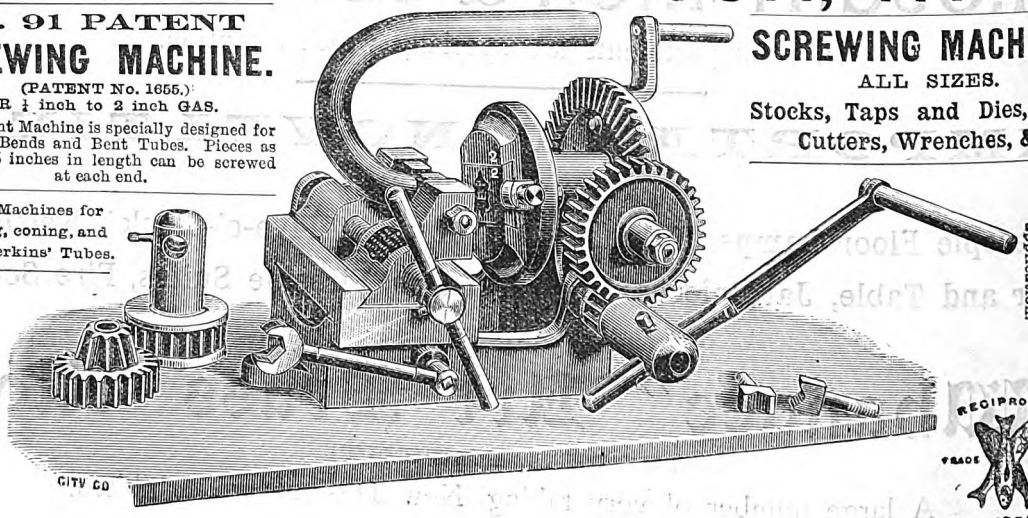
FOR PRICES APPLY AS ABOVE.

JOHN COWLEY & SON, HYDE.

No. 91 PATENT
SCREWING MACHINE.
(PATENT No. 1655.)
FOR ¼ inch to 2 inch GAS.

This Patent Machine is specially designed for Screwing Bends and Bent Tubes. Pieces as short as 3 inches in length can be screwed at each end.

Special Machines for screwing, coning, and facing Perkins' Tubes.



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ALL SIZES.
Stocks, Taps and Dies, Tube Cutters, Wrenches, &c.

Catalogues on application.

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Of every description for Home & Foreign Markets.

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MANUFACTURERS OF

WREATHS AND CROSSES

IN

Porcelain, Metal, Artificial and Cape Everlastings, Wreath and Cross Cases, Grasses, Bouquets, &c.

Price Lists on application.

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SANDHILLS, LIVERPOOL.

IMPROVED STEAM CRANES

WITH QUICK MOTIONS.
EXTRA STRENGTH AND DURABILITY.

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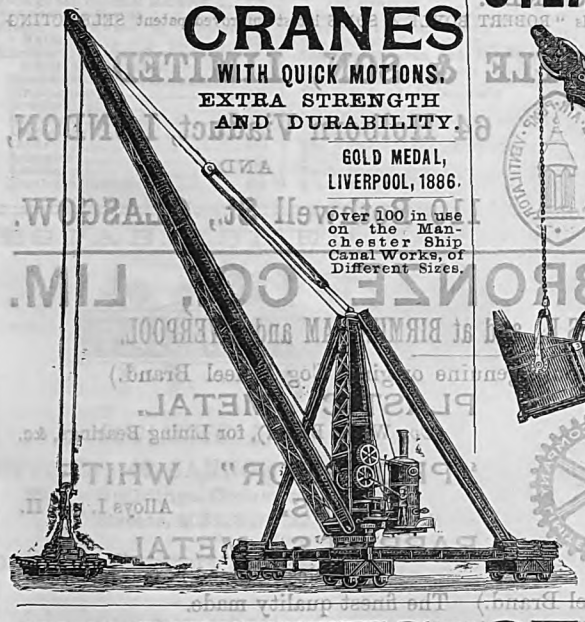
Over 100 in use on the Manchester Ship Canal Works, of Different Sizes.



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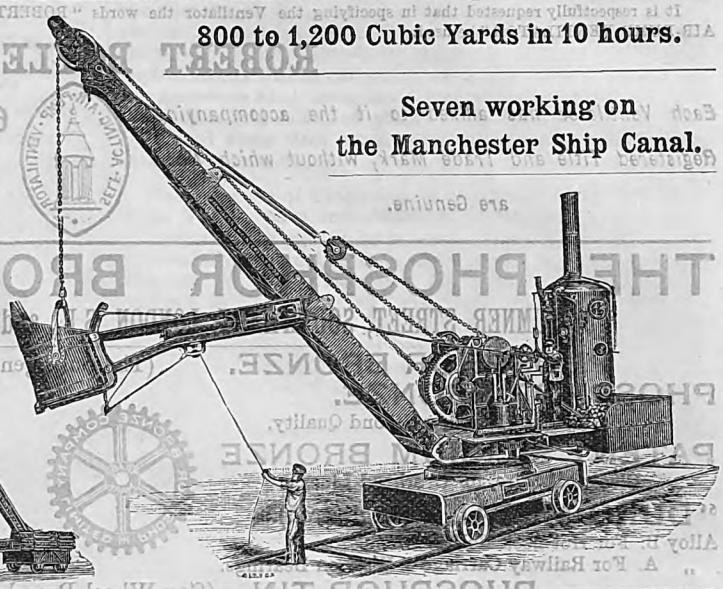
800 to 1,200 Cubic Yards in 10 hours.

Seven working on the Manchester Ship Canal.



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LOCOMOTIVE, PORTABLE, STATIONARY—FOR RAIL, DOCKSIDE, SHIPS' DECK, WHARF, OR WAREHOUSE.

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CONCRETE MEASURING & MIXING MACHINES

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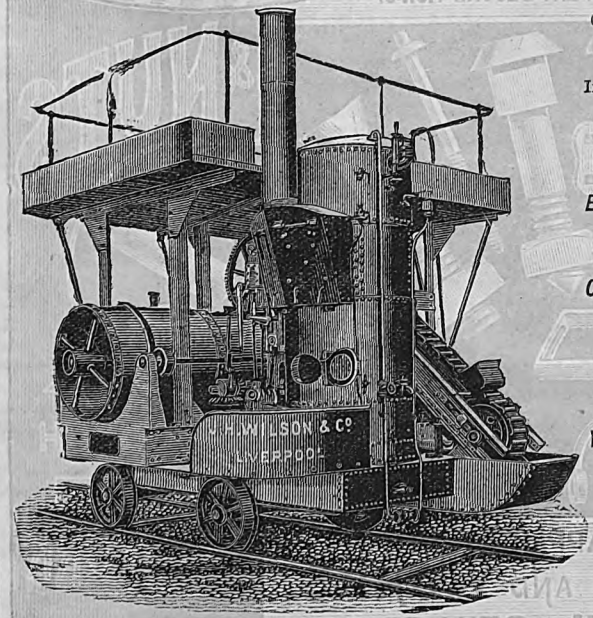

In use on some of the Largest Contracts in England and Abroad.

Effective and Rapid Mixing.

Only Machine that Measures and Mixes the Materials Mechanically.

With or without Engine and Boiler.

From 10 to 70 cubic yards per hour.

MARION
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SINGLE OR DOUBLE ACTING.

GOLD MEDAL, Liverpool, 1886.

IMPROVED STEAM WINCHES.

Horizontal or Diagonal.

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ESTABLISHED IN 1859.

THE IRONMONGER

PUBLISHED EVERY SATURDAY.

OFFICES: 42 CANNON STREET, LONDON, E.C.

Fink's Buildings, Corner of Elizabeth and Flinders Streets, MELBOURNE, VICTORIA,

AND

18 Queen's Chambers, Barrack Street, SYDNEY, NEW SOUTH WALES.

Subscriptions may commence from the first issue of any month, but are not entered for less than twelve months, and must in all cases be accompanied with trade cards; or, in the case of assistants, with the name and address of their employers.

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AT HOME OR ABROAD, TEN SHILLINGS PER ANNUM, POST FREE.

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THE IRONMONGER DIARY.—A copy of this valuable work is presented to each subscriber at home and abroad in the course of his year's subscription.

Displayed Advertisements go to Press on Thursday, but Advertisements under any of the headings mentioned below can be received up to first post on Friday mornings.

Charges for advertisements under the heading **Assistants Wanting Situations** are 1s. for twelve words, and 6d. extra for every line or portion after, ten words to be reckoned for each line. Names and addresses to be paid for. For advertisements appearing under the following headings:

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Note.—Letters addressed to Initials or fictitious names, to be called for, are not delivered from any Post Office, but are sent to the Returned Letter Office to be immediately returned to the senders.

Assistants replying to advertisements should in no case enclose their original testimonials. Copies only should be forwarded in the first instance.

Advertisers, by paying an extra fee of 6d., can have the replies addressed to THE IRONMONGER under a number, and such replies will then be forwarded post free.

Cheques and Post-office Orders to be made payable to **E. P. HALSE,** and crossed **MARTIN & CO.**

AMERICAN NOTES.

Consolidation of Shot Manufacturers.—A meeting was held in Chicago the other week for the purpose of forming a company of the sixteen shot-tower companies of the United States, with a capital of £3,000,000, incorporated under the laws of Illinois, with headquarters at Chicago. The title of the new company is the American Shot Association. It is proposed that all the plants be bought outright for stock in the new association, and be a complete consolidation under one central management; the companies taking stock surrendering their individual existence. Their individual capital stocks will be cancelled, each becoming a branch of the American Shot Association, and will be merged into the association at a valuation placed by an appraising committee, appointed some time since, who have just completed this feature of the work.

Manufacture of Tinplates in the States.—Messrs. Leyshon, Tipton, have introduced in McKeesport, Pa., a new process of making tinplates, and their work has been successfully accomplished at the United States Iron and Tinplate Works at Dammler, Pa. In an interview Mr. Leyshon said: "So far as I can learn, this is the only tin plant on this continent. The fact that this country has for the last ten or twelve years been paying nearly £30,000,000 annually to foreign countries, and that not a sheet of tin was being made on this continent, urged the firm to make strenuous efforts towards securing a protective tariff sufficiently high to enable them to compete with the cheap labour of foreign manufacturing cities; their labours have been crowned with partial success, as the clause in the McKinley Bill protecting tinplate has passed the House and bids fair to pass the Senate. If such action be taken, many mills for manufacturing the product will likely spring into existence. The process heretofore used consisted of five operations—two dipping in grease and three in tin. By the new process the same results are obtained in one operation, by inserting a sheet in a solution of tin and palm oil."

Another Electric Light Fatality.—Another horrible accident from electric lighting wires occurred on Monday at New York. A lamp upon a high pole opposite the Park Theatre did not burn well. The company was notified, and sent an expert lineman to repair it. He climbed the pole and strapped his legs around it to hold him securely, leaving his arms free. He discovered that there was defective insulation, and took a pair of lineman's pliers which were not insulated to cut the wire. The moment the pliers touched the wire people saw a flash of light jump from the steel, and an instant later sparks flew from the man's hair and from his mouth. His head fell back at the same moment, and his hands fell against the wires on either side of the lamp, and little clouds of smoke arose as the current burned his flesh. An engineer of the lighting company who happened to be in the theatre, borrowing a rubber overcoat from a cabman, asked a policeman to lend him his club, and climbed the pole. He wrapped the rubber coat around his right hand, and held the club in that. Getting within reach, he struck the man's right hand free from the wire with the club, and the pliers fell to the ground. The current being broken, the lineman's body fell backward, supported only by the straps around his legs. Ropes were fastened around his waist, the straps around his legs loosened, and the body was lowered carefully to the pavement. There were faint signs of life, but he died a few minutes later. He was badly burned on his hands and arms, and his face was horribly distorted. The lamp was supplied by underground wires with the high tension alternating current.

Petroleum in Canada.—Mr. McConnell, of the Canadian Geological Survey, has just returned from investigating the Athabaska petroleum-fields. He says there is a greater quantity of petroleum in these than in any known district in the world. Above the Athabaska river there are vast beds of sand 250 feet thick, saturated with oil for hundreds of miles.

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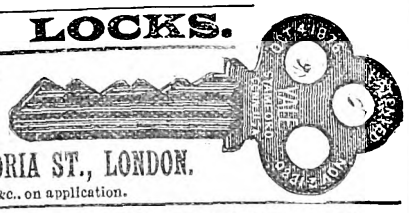

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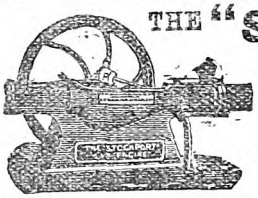

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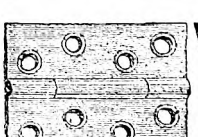

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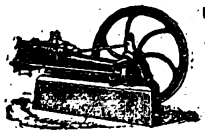

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EDITORIAL NOTES.

THE SEASON TRADE.

THE appearance of this special issue of THE IRONMONGER is an indication that the summer is over and the season for autumn and winter goods close at hand. There are many other indications of the same kind, and it is quite safe to assert that during the next few weeks a very appreciable number of orders will be given out for a great variety of goods. Manufacturers have been preparing their products for some months past, and now come forward with their announcements to the trade. Travellers are on the road with samples of the goods, and consequently the campaign for the autumn and winter may be said to have set in, even whilst we are enjoying, or have just enjoyed, the finest spell of summer weather during 1890. That manufacturers should have to anticipate the actual seasons with their products is an absolute necessity of the business. They run certain risks, it is true, by making their preparations so far ahead; but such risks are part and parcel of their businesses, and must be incurred by all who intend to be well to the fore. It is probable, however, that there is less risk with winter goods than with the articles prepared for the summer. Our winters are not all severe or even more than moderately cold; but the days are short and the nights long, thus necessitating plenty of artificial light, whilst the dampness of the winter season has to be guarded against as much as, or even more than, the cold. For these reasons the makers of and dealers in lamps, stoves, fireirons, and so forth are pretty sure of their trade, even though the skate business is bad and some few other goods move off slowly. Summer goods, on the other hand, are more particularly prepared for fine weather, and largely for outdoor use, thereby presupposing the existence of conditions which are amazingly uncertain in this capricious climate of ours. Thus, as the winter conditions are more dismally even, the sale of goods prepared specially for the season is the more certain. This year there is every likelihood of the trade being more than ordinarily good. In almost every department of industry considerable briskness prevails, thereby ensuring good wages and plenty of work for the artisan classes, as well as, we hope, reasonable profits for the employers. This activity having prevailed for the whole of the year, as well as during the greater part of 1889, it is only fair to assume that the working classes have rubbed off any indebtedness contracted during the dull times; and it is to be hoped that the agricultural portion of the community is in the same improved position. The harvest has proved much better than it at one time seemed likely to be, hence a general survey would appear to give the impression that the spending power of the British public should now be greater than at any time for many years past. We trust that ironmongers will reap a good share of the prevailing prosperity. Our advertising pages to-day give them plenty of excellent materials from which to select their stock of season goods, just as they serve to remind them of such other articles as are in request all the year round.

BETTER IRONMONGERS' SHOPS WANTED.

IT is not by any means the first time that we have suggested that there is ample room for improved ironmongers' shops, but the need seems to be almost as great now as it has been any time these dozen years or so. In again calling attention to the question we do not wish to convey the impression that some ironmongers do not march with the times, but rather that the great majority of the members of the trade do not move with sufficient rapidity. That this assertion is well founded cannot be denied, we think, by anyone whose acquaintance with the ironmongers' establishments of the country has been gained by personal calls. In a few towns—in which term we include London—there are spacious, well-fitted, and well-arranged shops; but they are in a minority, and the bulk of the ironmongery establishments are not what they ought to be. In some cases—perhaps in a great many—the want of due space and adequate display is owing to a want of capital, but there are scores of ironmongers who must be charged with not making the best use of the premises they possess. We have several such shops in our mind. Their windows are "lumbered up" with dusty cutlery, tools, tarnished oddments and electroplate, a number of chandeliers, obsolete coal-vases, and so on. Inside there may or may not be an approximation to order and regularity; but the stock is really not displayed at all, and is mixed up in a higgledy-piggledy manner throughout. In shops such as these nothing "sells itself," simply because the customers can see nothing distinctly, or, if it is distinctly visible, the article rarely looks presentable. Under such circumstances, the business never shows at its best, and the returns are kept down owing to the lack of a little care and taste. Where the windows are properly set out and the contents of the shop are cleverly arranged, customers are attracted, and the goods "sell themselves" to an extent undreamed of in the philosophy of the careless and non-progressive ironmonger. Contrast the two kinds of shops. Take, for example, the establishments of Benetfink & Co., Cheapside, London (whose names we mention simply as an apt illustration of our arguments), and contrast them with the shops of hundreds of other ironmongers all over the country. In the one case the windows are set to the utmost advantage, and the interior, if not exactly "a thing of beauty and a joy for

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ever," is bright, well arranged, and attractive. Goods suited for the different seasons are prominently displayed at the proper times, and all-the-year-round articles receive their due share of attention. In the other shops alluded to the windows are shockingly neglected, and the interior is often no better than a howling wilderness—a chaos of metallic products. It may be urged, of course, that it is not fair to compare a great central London establishment with suburban or country shops. To some extent this is so, no doubt, but we contend that it is possible for every ironmonger to display taste, to insist upon cleanliness and order, and to please rather than to repel customers. This is especially true of furnishing ironmongery, but it is possible for black and builders' ironmongery, as well as tools, to be shown and arranged very much more effectively than is done by many members of the trade. If the premises are not sufficiently large, they should be extended, and then the utmost care should be exercised in order to utilise every inch of space to the best advantage. Properly done, the outlay on these matters should, and will usually, be speedily recouped. The public nowadays are educated up to a higher standard than formerly. They require to be pleased, and they will enter bright and smart shops just as they avoid the dull and dingy ones. The draper gives his visitors ample room, and is most fastidious in setting out his windows and showrooms. The grocer revels in bright brasswork and an abundance of light—and so on in many other departments of retail trade. There is every reason why the ironmonger should also lay himself out to give the public plenty of light, tasteful window-dressing and a well-arranged shop. Some ironmongers do this and find it pays them well. They have all the materials necessary for display. Manufacturers produce for them an immense variety of most artistic and effective goods. There is no excuse, therefore, for the ironmonger who does not set his shop in order and give his local public the full benefit of his taste and care, as well as of the producers' art and skill. Those who possess handsome and well-arranged establishments will doubtless assist such aspirants as are not actually their competitors. If they like to do so through our columns we shall be pleased to give them space, and if a few of the best will send good sketches (or, better still, photographs) of their shops, we are quite disposed to reproduce them for the benefit of the trade at large.

THE USE OF METAL SLEEPERS OR TIES.

THERE has just been issued by the United States Government (Department of Agriculture, Washington) an exceedingly interesting and valuable report upon the "Substitution of Metal for Wood in Railroad-ties." The author is Mr. E. E. Russell Tratman, E.C., and there is included a discussion on "Practicable Economies in the Use of Wood for Railway Purposes," by Mr. B. E. Fernow, chief of the Forestry Division of the Agricultural Department. It is from the standpoint of the Forestry Division, indeed, that the whole subject is reviewed, the broad result being the most complete work on the question we have yet come across. The Government and the people of the United States have been exceedingly prodigal, not to say wasteful, in the use and abuse of the forests of that great country. Lumbering has gone on for a great number of years on a tremendous scale, the opening up of the country having necessitated the use of an almost incalculable quantity of wood annually, whilst fires and waste have accounted for a further large quantity. At length the Government has constituted a Forestry Division, the head of which evidently deems it high time to take stock of the near future of his particular domain. He does so in terms which should cause his countrymen to consider whether they can afford to destroy their forests and woods at the present rate. Mr. Fernow evidently is of opinion that it is high time to economise in this respect. He describes the wasteful use of timber for railroad-ties (sleepers), describes the policy of the companies in keeping up high-freight rates upon it in order to prevent "exportation" from their respective districts, and shows that the annual consumption of wood for railway purposes in the United States amounts to quite 500,000,000 cubic feet per annum. To get that very large quantity necessitates the culling of the best timber from more than 1,000,000 acres of forest lands, or to keep up the supply there would need a reserved area of probably 50,000,000 acres, or more than 10 per cent. of the present forest area of the United States. Having thus established his initial position, Mr. Furnow discusses at length the best methods of laying and preserving timber ties, their cost, and sundry other points, after which he gives a series of useful tables, showing the consumption of timber by districts for this purpose, costs, different sorts of wood used, and so forth. Then follows Mr. Tratman's report on metal sleepers, which is exceedingly thorough, and is supplemented by engravings and particulars of almost all, if not all, of the metal ties or sleepers at present in use all over the world. The report is so voluminous that we cannot possibly follow it in any detail, but must content ourselves with culling from it a few figures and statements, which show how rapidly metal is replacing wood for this purpose. The replacement is going on most rapidly in Germany, India, and certain South American countries; but it is of decided importance to iron and steel manufacturers to find indications of the change on a growing scale in nearly all countries where there are railways. It will probably surprise many, even of those who are interested in railway affairs, to learn that of the total length of railways in the world, excluding the United States and Canada, as much as 13·21 per cent. is laid already with metal track. We compile the following figures from Mr. Tratman's more detailed tables to show the proportion of metal track to the total length of lines in various countries:—

Countries	Total Metal Track	Total Track
	Miles	Miles
Great Britain	70	20,000
France	52	21,700
Holland	339	3,216
Belgium	115	3,544
Germany	8,786	25,144
Austria-Hungary	122	14,942
Totals of Europe	10,222	132,672
Totals, Africa	1,280	5,282
Totals, Australasia	186	10,640
British India	9,224	15,245
Totals, Asia	9 334	19,106
Argentine Republic	3,543	4,630
Totals, South America, Central America, and Mexico	3,787	19,461
North America	2	174,165

The total mileage of metal track is 24,803, of which 3,637 are of longitudinals, 10,013 of bowls and plates, and 11,059 of cross-ties. In view of these facts it is eminently justifiable to state that the question has passed far beyond the experimental stage, and it is a fair assumption that the use of metal sleepers is certain to increase steadily and universally. This result will come about, not only because the world's stores of timber are being depleted all too fast, but for the much stronger reason that there is a positive economy in the use of the metal articles. This latter is the argument which may be relied upon to convince the railway companies, and lead them to adopt the metal ties instead of the wooden ones. It should be the part of our iron and steel manufacturers to help on this process of substitution by all the means in their power.

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COLLATERAL BRANCHES OF IRONMONGERS' BUSINESSES.

On many former occasions we have made reference to this subject, and have thrown out various suggestions as to the "side" branches of trade which could be best adopted by ironmongers. We have reason for believing that our remarks and the correspondence resulting therefrom have not been without good results, but we fear, nevertheless, that a large number of ironmongers are still neglecting opportunities of adding useful and paying departments to their regular business. That such opportunities exist in not a few towns is beyond question, yet it is equally beyond question, unfortunately, that hundreds of ironmongers are quite content to proceed on old lines, and without the slightest innovation upon the procedure which usage has established for any number of years past. Some ironmongers may be doing so well in their own business that they have not the time or inducement to embark upon collateral branches, but we fear those in this category are few in number, and, as the phrase goes, "far between." But even if a man is doing very well there is no adequate reason why he should not try to do better. The draper, who may be taken to be the ironmonger's great retail rival, is always adding new departments to his original business, and so long as he can secure the traditional "small profits and quick returns," never seems to hesitate in handling any class of goods out of which he can make money. Without trying to emulate all the enterprises of the big drapers of the day, it seems to us that the ironmonger can take up many collateral branches and push them in fair and legitimate connection with his own business. It would be an easy matter to name quite a score of such additional departments, the goods in which can be handled by ironmongers with ease and with every chance of a reasonable rate of profit being secured. In this list there may be included by way of example:—

Clocks,	Microscopes,
Cheap Watches,	Magic-lanterns,
Bronzes,	Mechanical Toys,
Opera-glasses,	Games of all kinds,
Optical Goods,	China and Glass,
Pens and Pencils,	Basket-ware.

To this list might be added many other branches, such as photographic appliances, rubber goods, cabinet-case goods, portmanteaus, travelling-boxes in wood and leather, &c. There are, no doubt, times and seasons when these goods sell better than they do at other times, but they are mostly all-the-year-round articles, and can be handled without the employment of much additional capital or shop-room. Some of them are well known to bear excellent rates of profit, and, what is more to the point probably, several of them are not usually stocked or sold by other retail tradesmen in towns of small and medium populations. This latter consideration is one which has weight, no doubt, with many ironmongers who have devoted thought to the subject, seeing that the majority of ironmongers going into new branches prefer to do so without the liability of coming into direct contact with their fellow-tradesmen in the same town or locality. Even this consideration, however, does not restrain the enterprise of the pushing draper, so that the ironmonger who may see a chance of doing well in an additional branch ought not to allow too much sentiment to stand in the way of business. But besides the lighter departments of which we have spoken already, there are several others of a more weighty description which may be worth the attention of some, even if not all, ironmongers. In this category we include such goods as necessitate either more shop or warehouse room, or the employment of additional capital, and, perhaps, of skilled supervision or management. Thus, cycles may or may not suit all ironmongers, because of the space they require to enable them to be properly shown and kept in perfect condition. Cycling fittings and accessories are not in the same list, and can be handled by every ironmonger. Machine tools for various purposes would not suit every district, but in some places they, as well as all sorts of mill-fittings, can be stocked and sold to much advantage. Furniture, again, is too bulky to be stocked by some ironmongers, but many members of the trade are now doing well with it, and it is open to every ironmonger, no matter how small his shop may be, to keep and sell from an assortment of furniture-manufacturers' catalogues and price-lists. Steam-engine fittings, belting, and the like sell well in the large manufacturing towns, and are capable of being stocked in representative assortments without much risk or trouble. Where collieries and ironworks are numerous there is a demand for lubricating oils, grease, and engine waste—which demand should be studied by the progressive local ironmongers. The sewing-machine trade may very well be passed over as having been cut down under the weekly-payments system to a point which yields no profit to an independent retailer. There are many classes of goods, besides those enumerated, which deserve the attention of members of the trade. Some of them can be readily sold from catalogues, and, even if the profit secured is small, it is all "grist to the mill," provided the business can be done without much labour and free from risk. Some time ago several of our readers wrote describing their respective experiences in relation to several of these additional departments. Perhaps other readers may now be disposed to adopt the same course—in which case we shall be glad to accord to them sufficient of our space for that purpose.

IRONMONGERS AND TRAVELLERS.

The commercial traveller is one of the institutions of the country—indeed, we may say of the world. He pervades the land from end to end, and has the reputation of being the most energetic and persuasive of mankind. In many repects he is eminently useful as the connecting link between the producer and the distributor, but as his class seems to become more numerous every succeeding year, there are those who somewhat churlishly describe the commercial traveller as being "a nuisance." That is a very strong term to apply to so clever and pushing a body of men, but there is no reason for doubting that the word describes the actual sentiments of a large body of retail tradesmen. Some ironmongers declare that "half their time" is occupied in seeing travellers, whilst others have entirely lost their patience and decline to see travellers at all. It is pretty obvious that both these results are the outcome of a wrong method of doing business. The ironmonger who wastes half his time with travellers not only does himself an injustice, but is very likely to overstock himself. On the other hand, the ironmonger who refuses to see travellers at all runs the risk of missing saleable articles, and also is guilty of incivility to the traveller and his principals. The remedy is a very simple one. Fix a time, say between 9 and 10 A.M. for the reception of travellers and let the fact be well known. A brass plate to that effect outside the doorway will probably prevent interruption at other times. If a traveller has a stock-room for the display of his samples, a mutually convenient time can be arranged, and thus, in either case, the demands of travellers upon the time of the ironmonger are reduced to a minimum. A fixed time is fair to both parties alike, whereas desultory calls are not only annoying to ironmongers but are hindrances to travellers. But besides the waste of time, there are those who complain of

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the over-persuasiveness or persistency of travellers. Some ironmongers allege that there are travellers who "won't take no for an answer," but badger the customer until he "gives them a line"—or possibly shows them the way out of the shop. With every allowance for the feelings of those who thus complain we must confess that we are unable to sympathise with them very deeply. It is the duty of the traveller to be as persuasive as possible. That is his business, in fact, and to do less than his best would be a neglect of duty to his employer. There is a point, of course, where persistency should cease, but if the ironmonger knows his business and his actual requirements as he ought to do, the limit should be reached pleasantly, and without undue friction being developed. The days have gone by when the few men on the road looked over an ironmonger's stock themselves and filled in orders where they liked. Nowadays the ironmonger should always be ready to receive the traveller and know exactly what he wants—or does not want. Some members of the trade are never very clear on either head, and it is their vacillation and uncertainty which has done, and still does, a good deal to sharpen the appetite, and strengthen the persistency of commercial travellers generally. It is precisely the vacillators who adopt extreme courses: either they order nothing, or they order more than they really require, which latter contingency is not infrequently the cause of their subsequent difficulties. In dealing with travellers the ironmonger should know how to say "No" when he means it, and when he has thus decided in the negative should close the interview. On the other hand, if he is doubtful, or means to order, he should do so with equal decision. The traveller is very human. He does not crave for large "lines" everywhere, and he is generally satisfied with common courtesy. That, at all events, is due to him as well as from him.

THE WEEK.

An Ironmonger Fined under the Explosives Act.—A prosecution under the Explosives Act took place in Bristol on Tuesday. The defendant was George Britton, Bedminster, ironmonger, who was charged with storing explosives upon his premises contrary to the Act. Colonel Ford, Her Majesty's Inspector of Explosives, visited defendant's premises, and found he had there 180 lbs. of explosives, including 22,000 detonators, in excess of the quantity he was allowed to keep. Proceedings were taken against the defendant for the protection of the residents in the neighbourhood. He was fined 10*l.*, and ordered to pay 10*l.* costs. The explosives, valued at 30*l.*, were forfeited.

The Labour Market.—On September 13 the result was made known of the ballot taken the previous evening of the workmen employed by the Thames Ironworks and Shipbuilding Company (Limited) on the question of the adoption of the proposed scheme of profit-sharing submitted to the men by Mr. A. F. Hills, the managing director. The conditions were that, after receiving 23,750*l.* per annum as interest upon the shareholders' existing capital, the remainder of the profits should each year be equally divided between the company and their employés. The poll was by ballot, and when the figures were announced they surprised even the more sanguine of the opponents of the scheme. For adoption 570 voted, against 1,206; 107 were neutral, and 15 ballot-papers were spoilt.

The Harney Peak Consolidated Tin Company (Lim.)—Thomas Bolitho & Sons write in reference to the above: "We are now enabled to give you the result of the crushing and smelting of the tin-stone from Dakota which was sent us in the 43 cases about a fortnight since. The tin-stone received weighed 17 tons 15 cwt. 2 qrs. 12 lbs., and this yielded 18 cwt. 10 lbs. of black tin, say 114 lbs., or rather over 5 per cent. of black tin per ton of rock. This black tin assayed 70 per cent. for metallic tin. The quantity of metal in the ore obtained (18 cwt. 10 lbs.) calculated on the assay of 70 per cent. would be 12 cwt. 2 qrs. 18 lbs. As the result of our smelting, we actually obtained 12 cwt. 1 qr. 14 lbs. of refined tin, which we have to-day sent to you by rail, made up into 50 ingots and branded 'Harney Peak Tin.' The quality of the metal is superior refined. We may add that there would naturally be a greater loss both in the dressing and smelting of special small parcels, such as the above, than there would be in the continuous and regular way of working on a large scale."

Proposed Engineering-works in the West Highlands.—A Government Commission, representative of all interests, has, after careful examination into the conditions of the people in the West Highlands, presented a report to the Government, suggesting the carrying out of various engineering works, harbours, piers, boat-slips, buoys, beacons, and lighthouses, involving an outlay of about 300,000*l.*, for the encouragement of fishing, and to make intercommunication safer than at present. For a new railway to Mallaig, the cost of which will be 285,000*l.*, they suggest a guarantee of 2½ per cent. for four years, and a grant of 15,000*l.* for a harbour at Mallaig; a similar guarantee and grant for another railway from Stromeferry to Kyle, and harbour at Kyle; a grant of 40,000*l.* to each of two railways on the mainland; a grant of 53,000*l.* for harbour works on the island of Lewis, in the Hebrides; a grant of 20,000*l.* for new piers and boat slip; a subsidy of 10,000*l.* a year for four years to a steamer trading from that island; and a grant of 33,000*l.* for lighthouses, and 500*l.* for buoys.

Items about Ivory.—The importations of ivory into London since the public auctions held during the latter end of July have been very restricted, and amount to only 12¾ tons, viz., 8½ tons East Indian sorts and 3¼ tons West Coast African descriptions, whilst the balance is mostly made up of hippopotamus or sea-horse tusks. We shall, no doubt, get the bulk of the supply for the October sales during the month in which the sales are held, in accordance with the custom prevailing latterly. Touching the probable extinction of the elephant in the near future, an ingenious writer advocates a close time for the "earth-thundering beast," but he does not give us his ideas as to how the close time is to be enforced, or on whom the responsibility of enforcing it would devolve. It must be remembered that the African continent is rather a large place, and would require a good deal of supervision in the event of such an act becoming law. Since the July sales nearly 50 tons of ivory have been delivered from the Dock Companies' warehouses, as against 12¾ tons imported, as before mentioned. The stock at the end of August was 81¼ tons, as against 47¾ tons in 1889, and 82¾ tons in 1888. The total deliveries from the beginning of the year until the end of last month were 263¾, as against 282¼ tons imported during the same period.

Fires.—A fire broke out at Fielding & Platt's Ironworks, Gloucester, shortly before nine o'clock on Monday night. It is supposed to have originated in the pattern-shop, and, from the time of the outbreak, had a complete hold of the building, which was completely burned out in an hour or so. The damage is estimated at about 20,000*l.* Fielding & Platt request us to state that the fire is not nearly so serious as was at first supposed and reported. It appears that only the pattern department has been affected.—A serious fire occurred on Sunday afternoon in Newbury at the extensive engineering works of Plenty & Son, where large Government contracts are executed for marine-engines. The fire originated in the pattern-shop. There were stored patterns representing the work of over fifty years. The shop was soon wrecked. The fire extended to a timber-store and an adjoining builder's workshop, and assumed alarming proportions. The damage is estimated at several thousands of pounds, but, fortunately, the large number of men employed will not be thrown out of work or the Government work be stopped.—On September 13 a fire broke out in the girder-shed of Goodwins, Jardines & Co.'s engineering and bridge-building works at Motherwell. The erection is constructed of wood, supported by iron pillars. This, coupled with a fair breeze, caused the flames to spread rapidly, and before the fire-brigade arrived the flames had a firm hold on the structure. Although the

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damage is very considerable no delay of work was caused. The men employed in the burnt end of the building proceeded with their work in the other end of the shed. The damage is fully covered by insurance in three different Glasgow offices.

Mr. Gladstone at the Dee Ironworks.—Mr. Gladstone visited the Dee Ironworks, Saltney, more generally known in the district as Wood's Chain and Anchor Works, on September 12. Last year, at the opening of the Saltney Literary Institute, Mr. Gladstone spoke of machinery having superseded manual labour, such as hammering, and he congratulated the working-men on machinery having relieved them of the heaviest part of their toil. Mr. Wood, who was then present, good-humouredly corrected Mr. Gladstone, and assured him that if he would come to his works he would show him that he was mistaken, and that much hard hammering was still done. Mr. Gladstone accepted the invitation and witnessed the hammering in the manufacture of anchors and chain cables. Subsequently, at the local Literary Institute, he addressed the members on the dignity of hand-labour. The working-classes were, he said, making a mistake in trying to get their children into pen-work, as distinguished from handicrafts. Hand-labour admitted of being raised to a very high degree of excellence; and each man should endeavour to raise his manual production to the highest excellence of which it was capable. He deprecated the scamping of work, because it was a fraud both on the employer and on the workman himself.

The Shipbuilding Industry.—There has been launched from the shipbuilding-yard of C. S. Swan & Hunter, Wallsend, a steel screw-steamer, length over all 390 feet by 44 feet 3 in. by 28 feet moulded depth. The engines will be fitted by the Wallsend Slipway and Engineering Company (Limited), of triple-expansion surface-condensing type, capable of indicating 3,500-horse power, and of propelling the vessel 14 knots per hour. The vessel was named the *Citta di Venezia*.—On Monday a steel screw-steamer was launched by W. Gray & Co. (Limited), West Hartlepool, to the order of English & Co., Middlesborough-on-Tees. Her chief dimensions are:—Length, 260 feet; breadth, 36 feet 6 inches; depth, 18 feet 2½ inches. She has triple-expansion engines by the Central Marine Engineering Company, and was named the *Coatham*.—Caird & Co. (Limited) launched from their shipbuilding-yard at Greenock on Saturday a steel screw-steamer of 3,450 tons gross. Length, 357 feet; breadth, 43 feet; depth, moulded, 29 feet 1 inch. She will be supplied by the builders with triple-expansion engines of 2,600 indicative horse-power. The cylinders will be of 29, 48, and 77 inches diameter respectively, with 4 feet 6 inches stroke. The two boilers will be double-ended, and made entirely of steel, having twelve furnaces, and will be tested by hydraulic pressure to 340 lbs. per square inch. She is named *Prince Hendrick*.—On Monday William Denny & Brothers launched from their shipbuilding-yard at Dumbarton the screw-steamer *Virawa*, of about 3,500 tons gross register, for the British India Steam Navigation Company.—Scott & Co., Greenock, shipbuilders, launched on Monday a steel screw-steamer of 2,900 tons gross, named the *Polyphemus*, for the Ocean Steamship Company, Liverpool. Dimensions: — Length, 336 feet; breadth, 38 feet; and depth, 26 feet.

Trades and Industries Classes at Manchester Technical School.—During the week introductory addresses are being given in connection with the opening of the winter session of the trades and industries evening classes at the Manchester Technical School. The first was delivered on Monday night by Mr. Alderman W. H. Bailey to the students who have entered for the course of instruction in engineering. The chair was taken by Mr. F. W. Follows. There was a very large attendance. Mr. Bailey said he knew of no trade, no profession, which required so much hard study, so much imagination, and so much knowledge of values as that of the engineer. He must know something about everything, but above all he must know everything about something. Their future course as engineers would be guided and controlled by the followers of Dr. Joule, the great discoverer of the mechanical equivalent of heat, whose name would for ever rank with those of Galileo and Newton and other schoolmasters of God's creation. The coming man would be the Thermist. The progress made in the mechanical use of energy, heat, and force during the last twenty years had been much influenced by this increased knowledge of the reign of law. As a result of the experiments which Dr. Joule carried to so successful an issue, the engineer was enabled to verify his examinations and to regulate his forces with nearly as much precision as if he were using weights and scales on a shop-counter. Dr. Joule ascertained that a weight of 1 lb. would have to fall 772 feet in order to raise the temperature of water 1° Fahr. He determined the relation between units of heat and potential energy of gravitation by his various methods. If young Englishmen ever had a chance they had it now, for the rewards of scientific and honest industry were greater than ever. We had many inherited qualities and the best geographical position in the world, if we only had the wit to see and use and appreciate our lot. A hearty vote of thanks was accorded to Mr. Bailey for his address.

OBITUARY.

[Intimations of the deaths of those connected with the trade should be sent to us as early as possible, with concise details of the business careers of the deceased persons.]

The death is announced of Mr. Alderman Walmsley, J.P., who expired at his residence, Brooklyn, Great Lever, Bolton, shortly before eleven o'clock on Saturday night. The deceased, who had attained the age of 78 years, was attacked with very severe illness something like three years ago; but, though he recovered to a certain degree from this, he had never since been as strong as previously. Mr. Walmsley was a native of Bickerstaffe, near Ormskirk. He settled in Bolton, however, in 1827—while in his "teens"—and was apprenticed to Mr. Peter Walker, an ironmonger, then carrying on business in Wood's Court, Deansgate. Mr. Walker gave up these premises, to go into cotton-spinning, before Mr. Walmsley had finished his apprenticeship, which he completed with Mr. Samuel Cartwright, once a well-known ironmonger, in Deansgate. In October, 1835, Mr. Walmsley entered into business on his own account on premises in the same thoroughfare, and, as trade developed considerably, he some years afterwards removed to an extensive establishment which he built in Oxford Street, and which at present and for many years past has been carried on, also as an ironmongery concern, by Messrs. Richard Walmsley (brother of the late Alderman) and James Fisher. When Mr. Thomas Walmsley discontinued trade operations there, he conducted a most extensive business as an iron merchant at a large warehouse which he constructed in Fold Street. In 1868-9, Mr. Walmsley established the Atlas Forge—a concern for the manufacture of wrought iron, such as girders for railway and road bridges, mills, and other structures; rails, wheel-tires, machinery shafting, rods, puddled bars, &c. On one or two occasions the establishment has been visited by members of the Iron and Steel Institute, to which important organisation Mr. Walmsley belonged, and in whose proceedings he evinced much interest, often attending their annual congresses and other meetings. On January 8, 1874, the Forge was the scene of a terrible disaster, a vertical boiler exploding and killing six persons, eighteen others being injured; damage was also caused to the works to the extent of nearly 5,000*l*. Soon after establishing the Atlas Forge the deceased erected a warehouse for the storage of manufactured iron. For many years Alderman Walmsley was engaged in the cotton-spinning business, in partnership with the late Mr. Jno. Harwood, J.P. About 1875, however, Mr. Walmsley retired from this connection, thenceforward devoting himself exclusively to his business as an iron manufacturer and merchant, along with his corporate and other duties. For the long period of close upon twenty-three years Mr. Walmsley had been, continuously, a member of the "Local Parliament"—six years as a Councillor and seventeen as an Alderman. He was elected Mayor of the Borough in 1869, and in 1870 was re-elected to that office. He had been a justice of the peace for twenty-two years. He was a Conservative and member of the Established Church. He leaves surviving one son and one daughter. Mrs. Walmsley died several years ago.

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TRADE NOTES.

[We are always glad to receive PROMPT intimations of the starting of any firms, dissolutions of partnerships, changes of addresses, and other notices suitable for insertion under this head. All communications must be duly authenticated.]

Mr. S. V. Morgan, one of the proprietors of THE IRONMONGER, will be in the United States and Canada during October and November, and may be addressed to care of Mr. C. F. A. Hinrichs, 29 Park Place, New York.

Hall & Sanderson, Paddock, Huddersfield, plumbers, have dissolved partnership.

H. Holmes & Co., Halifax, tool-makers, have dissolved partnership. Mr. S. Moore retires.

Fisher & Sharp, 172 Queen Victoria Street, ironmongers, have opened three additional show-rooms over their present premises.

Boalth & Co., Hubert Road Works, Selly Oak, Birmingham, have decided to alter the title of their firm into "Bolt & Esmark."

W. H. & J. Wathen, Birmingham, die-sinkers, piercers, lamp-fitting manufacturers, and brassfounders, have dissolved partnership.

James Armstrong & Co. (Limited) have removed from Fore Street, E C, to more extensive premises at 116 Queen Victoria Street, E.C.

E. Lucas & Son, Dronfield, ironfounders, spindle and flyer manufacturers, spade and shovel manufacturers, and general merchants, have dissolved partnership.

Mr. E. M. Winton, Tiverton, ironmonger, has disposed of his business to Mr. George Crocker, Dorchester. A valuation between the parties has been made by Mr. Munk, Exeter.

Arthur Smith and Frank Edwin Harper, 9 Bromsgrove Street, Birmingham, plumbers' merchants, have dissolved partnership. Mr. Smith will carry on the business on his own account.

G. Fowles & Son, River Foundry, Green Street, Birmingham, engineers and machine-tool makers, have acquired the business, together with all patent rights, formerly carried on by Mr. E. Symmonds at 305 Bradford Street, and at River Foundry, Cheapside.

Cooper Brothers, 32 Woodcock Street, Birmingham, after laying down a new plant, have commenced business as coppersmiths and braziers, embracing general metal-spinning in all its branches, both for the home trade and those articles specially required for the Indian and West African trade.

Mr. Thomas Hunter, Implement Works, Maybole, has been awarded a special silver medal for his new patent "Hunter" hoe at the Staffordshire Agricultural Society's Show. A silver medal was also awarded to the same implement at the Wirral and Birkenhead Agricultural Society's Show, held at Birkenhead on September 3 and 4.

W. B. Fordham & Sons (Limited), York Road, King's Cross, N., have taken up the agencies for the London district of the "Peerless" and "Banner" zinc washboards and "Avenue" liquid gold, the latter being a specialty in gold paint which is claimed to have excellent qualities for decorative purposes, and suitable for indoor or outdoor work.

Mr. R. W. Hudson, Bungay, has just succeeded to the business carried on for forty-three years by his father, Mr. J. E. L. Hudson, recently deceased. Mr. Edward Ison made the valuation for all parties. Mr. Hudson is in possession of very complete genealogical records of his family, tracing its descent from the Saxon chief Huda, alderman of Surrey, A.D. 853.

Atkinson Brothers, Milton Works, Sheffield, have again secured the Government contract for forks and table-knives. The supply of the former amounts to 160,000, and of the latter 74,000.

The Scotch Iron Trade.—Scotch ironmasters, representing 73 furnaces, now blowing, met in Glasgow on Wednesday afternoon, and agreed that they would take united action if the men persisted in demanding an advance in wages. In such a case they would put all their furnaces out of blast on October 4.

The Exports of Tinplates, Iron, &c., from the Bristol Channel ports to the United States and Canada for the month ending August 31 were as follows:—To Montreal and Quebec, 1,160 tons rails, 49,959 boxes tinplates, and 9,033 boxes Canada plates; to Montreal, 2,739 tons rails, and 6,868 boxes tinplates; to New York, 136,708 boxes tinplates; to Baltimore, 67,857 boxes tinplates; to Philadelphia, 23,078 boxes tinplates; to New Orleans, 10,463 boxes tinplates.

Mr. David Grey, formerly managing director of the Llwydarth Tinplate Company, and his sons have taken the Caerleon Works, near Newport, and propose to carry them on as a limited company, "David Grey & Sons." The Caerleon Works was run by the Llwydarth Company, but has been standing for some time. The nominal capital of David Grey & Sons (Limited) is 6,000*l.*, in 10*l.* shares, and the directors are Messrs. David, F., and J. Grey, and Mr. Berner, Maesteg.

Mr. J. C. Humphreys, Knightsbridge, S.W., iron buildings constructor, is engaged upon the erection of two large iron buildings at Great George Street, Westminster, for the purpose of temporary offices in connection with the census of 1891. The buildings are 250 feet long by 30 feet wide, and 100 feet long by 27 feet wide. Between the two will be situated general offices, besides accommodation for attendants, and they are to be ready for occupation early in October.

Mr. John H. Fraser (lately in partnership with his brother, Mr. G. C. Fraser, as "Fraser & Fraser," at Bromley-by-Bow) has now taken works at Millwall, which he has fitted with all the newest machinery and plant for the production of high-class work in boilers, bridges, tanks, &c. He has taken into partnership his son, Mr. Harry J. Fraser, who has a practical knowledge of the trade, and the firm will be known as "John Fraser & Son." The City address is 110 Cannon Street.

Mr. John Spencer, Globe Tubeworks, Wednesbury, and 14 Great St. Thomas Apostle, London, E.C, has just started his new works for the manufacture of lap-welded iron and steel tubes. The machinery is of the latest design, and is specially adapted for the manufacture of high-class boiler-tubes, hydraulic and large-sized well and water services, pipe line, tubes for compressed air, and tubular coils for heating, superheating, and refrigerating; also for Perkins's high-pressure hot-water tubes and telegraph-poles.

The Sherrin Electrical Generator.—A new form of electrical generator and motor has been invented by Mr. J. Vaughan-Sherrin, by means of which the propulsion of boats, tricycles, and Bath chairs is effected without accumulators. The generator is a two-fluid primary battery, in which the anodes are of zinc and the cathodes of carbon specially prepared. The depolarising liquid is a special composition which can be produced at a low cost; the zinc elements are immersed in plain water. The net cost of electric energy is estimated at from 9*d.* to 10*d.* per Board of Trade unit. The motor is a modified two-pole Gramme machine, having the field-magnets constructed in a special manner. It can be driven in either direction with equal efficiency, and is remarkably free from sparking at the commutator. It is very light, a one-horse power motor weighing only 62 lbs., and it is well under control, being easily started, stopped, and reversed. It has been tested by Professor Sylvanus P. Thompson, and a half-horse power motor was found to give an efficiency of 65 per cent. It is stated that there is an entire absence of danger to those who are working the apparatus, as there is no chance of receiving a shock. Trials recently took place at the offices of the Sherrin Electric Generator Company, 48 Eagle Wharf Road, London, and were very successful, as demonstrating the capabilities of both the generator and the motor.

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PRICES AND DISCOUNTS.

[Catalogues, Price-lists, &c., should be sent to the Editor immediately they are ready for being issued. Old Catalogues and Price-lists cannot be noticed under this head.]

Morewood & Co.'s Successors (Limited), Lion Galvanising-works, Birmingham, advise that, in consequence of the advance in prices of iron and spelter, their minimum rates for galvanised corrugated sheets are from September 15 advanced to 13*l.* per ton, in bundles, for 24-gauge, delivered f.o.b. Liverpool, in lots of 10 tons and upwards, less 2½ per cent. cash discount.

The following firms, &c., have issued new and revised catalogues and price-lists: —

Mr. W. H. Exley, Wapping Road, Bradford, price-list and pattern-sheet of new designs in fenders, fire-irons, and fire-stands.

Holden & Brooke (Limited), Salford, new catalogue of exhaust-steam injectors, live-steam injectors, exhaust feed-heaters, water lifters and elevators, safety-valves, piston-rings, special boiler and engine fittings, boiler-drilling machinery, &c. Well printed and clearly illustrated.

The Egan Company, Central Avenue, Cincinnati, Ohio, U.S.A, illustrated broad-sheet of patent wood-working machinery. The illustrations, though representing only a small portion of the machines built by the firm, number over 100, and are executed in the best style of modern wood-engraving.

Shaw & M'Innes, Firhill Ironworks, Glasgow, revised list of gas and water pipes and accessories, with tables of diameters, thickness of metal, average weight, and prices—the English measurements and weights being given also in the metrical system. The list also contains illustrations of various special fittings for sanitary and other work.

J. Attwood, Foster Street, Stourbridge, revised price-list of pipes, bends, connections, tee-pieces, combination joint and valve pipe-stands, cisterns, coil-ends, steam-radiators, gratings, coil-cases, valves and cocks, furnace-fittings, saddle, "Excelsior," "Trentham," and other boilers and appliances required in hot-water heating and hot-water supplies.

The Wenham Company (Limited), Upper Ogle Street, W., new price-list for the 1890–91 season of artistic metal-work novelties, comprising fire-screens, with handsome glass panels, a number of new designs in "Wenham" lamp pattern, both for indoor and outdoor purposes, and a selection of electric-light fittings which intending purchasers will do well to inspect before placing their orders.

D. Hulett & Co. (Limited), 55 High Holborn, illustrated catalogue of electric-lighting plant and material, engines, dynamos, accumulators, switches, lamp-holders, electroliers, brackets, suspensions, standards, &c., in high-class brass, copper, or hammered iron, finished in gilt, lacquer, ormolu, polished and oxidised silver, or antique; also fancy lamp-shades, glass globes and shades, and other accessories. The book is profusely illustrated by means of high-class engravings, and is altogether a most creditable production.

Townshend & Co, Ernest Street, Birmingham, and 62 Holborn Viaduct, have just issued a catalogue of most *recherché* designs in artistic metalwork articles in Louis XV. and Louis XVI. styles. The objects illustrated embrace telescopic floor-lamps, table-lamps, jardinières, mirror-sconces, paper-racks, coal-vases, fenders and fire-irons, hall-brush sets, musical tubes, Burmese and other gongs in great variety, spirit-kettles for 5 o'clock tea, modelled pottery vases, flower-stands, clocks, writing-sets, photo-frames, newspaper and music racks, &c.

The following firms have lists, circulars, &c., bound up with the advertisement pages of the present issue, some of the insets being in the front and some at the back part of the journal:—

A. E. Allen & Co., 37 Wellington Street, Hull, explain in detail on the first and second pages of their two-leaved inset (printed on lemon-coloured paper) the advantages of their patent valve-tap, the construction of which is rendered clear by means of sectional and perspective illustrations. Drawings are also given of gun-metal plug and gland taps, with screwed ends and flanged ends, as well as particulars of improved plug-taps, double-gland blow-off taps, and "Needham" blow-off taps.

The Aone Company, 181 Queen Victoria Street, E.C., insert a double-leaved catalogue easily identifiable by the indigo tint of the outside, and the salmon-coloured tint of the inside pages. The entire inset is devoted to illustrations and letterpress explanatory of the advantages of the firm's patent fuel-economiser or adjustable false-bottom, which is made in hundreds of sizes to suit any kind of kitchen-range or register stove, and the use of which is claimed to effect a saving in fuel of 50 per cent.

Aspinall & Co., New Cross, S E., again utilise the Special Issue for reminding readers of THE IRONMONGER, by means of a four-page circular, of the extensive variety of colours in which their world-renowned enamel is being kept in stock, and the numberless purposes to which this material is applicable in beautifying, preserving, and renovating articles of the household.

Atkinson Brothers, Milton Works, Sheffield, invite attention, through the medium of a four-page list, to the advantages of cellulose (or ivoride) handled cutlery. Quotations and illustrations are also given of table-cutlery in bone and ivory haftings, for full sets of knives, forks, carvers, fish-eaters, &c., in handsome cases of various kinds; for pocket-knives, razors, and scissors, and also of Britannia-metal tea and coffee pots, electroplated cruets, biscuit-boxes, butter-dishes, and so forth.

Atkinson Brothers, 1 Graham Street, Birmingham, with commendable enterprise, avail themselves of this issue for circulating a twelve-page catalogue, containing an innumerable variety of illustrations, particulars, and prices of such articles as spoons, forks, nickel-plated call-bells, cruet-stands, steel toys, carded tools, children's garden-tools, fret-work sets, hat-pegs, trunk-handles, toy magnets, hair and cloth brushes, ladies' companions, purses, crumb-trays, knife-baskets, rug-straps, spirit-stoves, skates, horse-clippers, shoe-lifts, drilling-machines, braces and bits, carded steel Albert chains, scissors in albums and loose, bench-vices, stocks and dies, coach wrenches, American braces, &c.

Henry Bamford & Sons, Uttoxeter, have prepared and sent for insertion an attractively got-up list of four pages. On the front is a tasteful trophy, formed of the flags of various nations, enclosing a shield, upon which is placed an outline of the globe, with a corn-mill occupying a prominent place in the centre. On the following pages are well-drawn illustrations of several sizes of the "Rapid" corn-mills—a specialty with this firm—and also sketches of patent chaff-cutters, cake-mills, turnip-cutters, and horse-gears.

Benham & Froud (Limited), Chandos Street, W.C., call attention, by means of an attractively-printed and nicely-arranged four-page inset, to a variety of goods in artistic and general metal-work, suitable for the present season. Some new and handsome designs in pedestal floor-lamps will be found specially worth attention, whilst in afternoon tea kettles and stands and brass and copper coal-scoops several new and entirely original patterns are represented. Amongst the articles shown on the list which are rather more useful than ornamental may be mentioned the "Rapid" cookery-steamer, the "Demon" beetle-trap, the "Umbrellifer" umbrella-stand, "Chandos" carpet-sweeper, and a fruit-peeling machine.

Mr. John Blakey, Lady Lane, Leeds, again calls attention to his unrivalled boot-protectors, the entire front of his four-page cerise-coloured circular being occupied with the

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"Bartholdi Statue" trade-mark, and reasons why these boot-protectors should be preferred to all others. On succeeding pages are given descriptions and illustrations of the "Paragon" last, the "Kicker" toe-tip, patent step-protectors, the "Denison" file-cutting machine, Firth's cash register, &c.

T. & R. Boote, Burslem, avail themselves of the facilities offered by the present issue for bringing under the notice of the trade a facsimile representation of a new pattern in majolica tiles specially adapted for hearths. The design is beautifully printed in colours and is the exact size of the original article.

S. Clark & Co., Park Street, Islington, very seasonably insert a two-page inset, giving illustrations and descriptive information as to the various sizes and styles in which the "Hygienic" gas heating-stove is made. Illustrations will also be found of ornamental tile stands for these stoves, and of Clark's "Phœnix" heater for oil burning.

Clarke's "Pyramid" and "Fairy" Light Company (Limited) insert a handsome catalogue, consisting of no fewer than sixteen pages of cerise paper, in which are given a large variety of illustrations of "Fairy Pyramid" lamps in crystal and coloured glass, illustrations of nursery lamps, with improved pannikins in several styles, particulars of the "Burglar's Horror" night-light lamp, patent "Fairy" menu lamps, "Fairy Pyramid" lanterns, the patent "Wee Fairy" lamp and lights, Clarke's adjustable bed-tray, and so forth.

Crowden & Garrod, 62 Southwark Street, S.E., inset a four-page circular, giving an extended list of goods selected from the innumerable articles made or factored by them. Foremost appear illustrations and prices of various descriptions of paint-brushes, fitted with Oates's patent suspenders, these being followed by drawings of household brushes, unbreakable pulp-tubs, tool-baskets, carpet-sweepers, air-guns, egg-beaters, thermometers, lemon-squeezers, door-stops, petroleum cooking-stoves, spirit-stoves, mincing-machines, bread-slicers, "Home Comfort," &c.

Mr. J. C. Dalman, Chunk Foundry, River Sreet, Birmingham, has a four-page inset containing illustrations and particulars of some of his latest productions. Special prominence is given to an improved polishing-lathe, with patent adjustable cone bearings, which, it is claimed, will last a lifetime. Illustrations are also given of copying-presses, bronzed-iron restaurant tables and umbrella stands, and fire-iron rests.

H. Darwin & Co., Eglinton Street, Glasgow, a four-page list of "Darwin" gas-fires, constituting a new departure in this method of heating, whilst at the same time ensuring a diminished gas consumption. The list contains a number of attractive designs, and particulars are given of the various styles in which the metalwork can be finished. The patentees claim that these appliances give the nearest resemblance to coal-fires yet devised.

H. & C. Davis & Co., Camberwell Road, S E, have availed themselves of the facilities offered this week to the extent of inserting a sixteen-page list, the large space thus provided enabling the firm to give a comprehensive selection from their chief productions. These include condensing-stoves (which dispense with the need for flue-pipes) in various plain and ornamental casings, thermo-hygienic ventilating-stoves, patent asbestos fuel fires in large variety, metal fires, "Cheerful" heating-stoves, portable kitcheners, copper bit-stoves, portable gas-furnaces, gas-baths, circulating boilers, greenhouse-heaters, and an abridged list of hot-water pipes and fittings.

W. F. Dennis & Co., 11 Billiter Street, E.C, as sole agents for Felten & Guilleaume, Mülheim, devote a two-page circular to quotations for that firm's celebrated patent galvanised steel-barb fencing-wire, rolled black fencing-wire, best annealed drawn solid wire, galvanised strand for fencing, sharp-cut staples, &c.

Doulton & Co, High Street, Lambeth, invite attention, by means of a handsomely-printed two-page inset, to the points of excellence of their glazed-ware gas-stoves, which are constructed entirely of glazed fireclay, and combine the advantages of perfect combustion and direct radiation with entire freedom from smoke or smell. These stoves are made in a variety of handsome designs (two being shown on the inset), and will burn for three hours at a cost of 1*d*.

Mr. Henry Dunsford, 82 Duke Street, Liverpool, sends a two-page inset giving information and an illustration of his new food-warmer for the use of infants or invalids, the heating medium being an ordinary night-light. The article is supplied either with an earthenware pan or tin pan as preferred, and seems a good thing for ironmongers to take up.

Follows & Bate (Limited), Gorton, Manchester, utilise the special issue for circulating an attractively prepared two-page inset containing a pictorial illustration showing the patent "Rex" chopping-machine in actual operation. The reverse side of the sheet is occupied with a selected list of valuable testimonials from recognised authorities as to the merits of the machine.

Robert Foster & Co., Moseley Street, Birmingham, send a two-page inset, showing a few of their latest styles in wood and iron coal-vases, together with illustrations of Scarborough trunks, bonnet-boxes, Archimedean chimney-tops and ventilators, legal nests, safes, &c.

Gabriel & Co., A B Row, Birmingham, devote a four-page circular to an exposition of the advantages of their improved patent syphon flushing-cistern and patent ball-cock, accompanying the description with an interesting selection of testimonials as to the efficiency of these appliances, received by them from waterworks engineers, surveyors, and others.

John Gardner & Son, Smithfield Works, Birmingham, insert a two-page list, giving illustrations of several sizes of their celebrated "Simplex" silent sausage-machines for both steam and hand power, and also an illustration of the "Premier" sausage-filling machine.

W. H. Gummer & Co., Effingham Brassworks, Rotherham, have a four-page list exclusively occupied with illustrations of brassfoundry, such as cocks, unions, ball-valves, safety-valves, lubricators, steam-whistles, taps, and general steam and water fittings, including the well-known "Niagara" flushing-cistern.

The Hardy Patent Pick Company (Limited), Sheffield, give illustrations and descriptive particulars on their four-page inset of the improved "ratchet," the "Elliott," and the "Conqueror" hand boring-machines; also representations of the "Universal" and "Acme" solid steel contractors and mining-picks, together with shovels, spades, hammers, and wedges. The last page is devoted to illustrating and describing the advantages and capacities of the "Davil" disintegrator—an apparatus which distanced all competitors at the recent Royal Show at Plymouth as a bone grinder and mixer.

Harger Brothers, Settle, give information on their two-page inset which dealers in and users of fretwork material and outfits will find very useful. Particulars are given of Buhl saw-frames, mitre-cutting machines, fretwork treadle-machines, fretwork-drills, patent draught and dust excluders, and other specialties for which this firm are becoming well known.

Hill & Smith, Tipton, devote a portion of their four-page list to illustrating and describing the advantages of their patent self-adjusting galvanished sheets, which can be fixed in one-sixth the time and with one-fourth the quantity of fittings required by ordinary sheets. Two styles of sheet are represented—viz, the "corrugated" and the "tile" pattern—and full particulars as to the covering capacity and weights of the material are given. The last page of the circular contains a drawing and information respecting the corrugated buckets of which Hill & Smith are the sole makers.

Charles Joyner & Co., Birmingham, and Colonial Buildings, Hatton Garden, EC., insert a four-page list, on which will be found some new and well-drawn designs of plain and ornamental gasfittings, comprising polished and bronzed

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scroll brackets, pendants, gasaliers, hall-lamps, &c., suitable for large and small houses, the illustrations merely serving to give buyers an idea of the class of goods which are made in great variety by this firm.

The London Fire-appliance Company, 126 Buchanan Street, Glasgow, devote their two-page list to illustrations of their patent improved condensing-stoves for either gas or oil, combination heating and lighting stoves, artistic Doulton-ware combination gas-stoves, and chemical fire-extinguishers, such as "L'Extincteur," Dicks's "Fire Queen," Dicks's "Little Fire Queen," and so forth.

Milners' Safe Company, 28 Finsbury Pavement, E.C., have a handsomely-printed two-page inset, one side being occupied with an illustration of the company's latest invention—a new "Grip Bolt" safe, possessing fastenings of a simple and novel design—and the other side containing illustrations of their A, B, and C patterns of special safes.

William Ramsay & Co., 254 Argyle Street, Glasgow, have a nicely printed 4-page inset, containing drawings and particulars of their leading specialties in lighting appliances. These comprise the Siemens circular-flame and the horizontal flat-flame regenerative gas-lamps; entrance-door lamps, and several handsome patterns of outside shop-lamps, including Ramsay's patent opal back-lamp, specially adapted for jewellers, hosiers, drapers, and others.

Edward J. Shaw & Co., Astral Works, Walsall, show on their two-page list several patterns of lamp-globes in patent "Murano" glass, as now made in ruby, blue, citron, and old gold; an illustration and description of the "Pilot" hurricane lantern; the "Siam" coronet (referred to in detail in our Novelty pages); and the patent safety centre-draught "Brunel" table and suspension lamps.

Samuel Snell & Co., 59 Skinner Lane, Birmingham, have a four-page list, on which are depicted well-drawn representations of the patent "Eiffel" hurricane-lantern, tricolour guards' lamps, coach-lamps, engine head or tail lamps, lamps for engine-rooms, water-gauge lamps, patent "Plimsoll" ships' side, stable, camp, platform, contractors', and street lamps, and a special selection of cycle-lamps—a line in which this firm have made themselves a reputation.

Spear & Jackson, Ætna Works, Sheffield, utilise a two-page circular for illustrating a selection of their mining, quarrying, and platelayers' tools, as manufactured by them by improved machinery. The designs comprise picks, hammers, shovels, spanners, ratchet-braces, twist-drills, and other boring appliances.

W. Summerscales & Sons, Phœnix Steelworks, Keighley, with commendable enterprise, insert an eight-page catalogue, printed on grey paper, the extended space being utilised to bring into prominence the chief productions of the Phœnix Works. As the largest makers of washing, wringing, and mangling machines in the world, the greater part of Messrs. Summerscales & Sons' list is naturally occupied with illustrations of the leading patterns of laundry appliances turned out by them. These include the "Old Favourite," the "Good Luck," the "No. 61," the "No. 69," and the "Champion" wringing and mangling machines, the "Household" washer, the "Triumph" washing-machine, the "Queen" ironing and finishing machine, the "Cheltenham" ironing-stove, and the "Practical" washing and disinfecting machine. The agricultural-implement department is represented by an illustration of chaff-cutters and turnip-cutters, and the general branch by particulars and sketches of the "Safety" step-ladder, and an improved sack-truck.

J. J. Thomas & Co., 360 Edgware Road, W., have a four-page list, on which illustrations and letter-press are arranged so as to show to the best advantage the leading patterns of wire goods made by them. Fire-guards in several styles and kinds of material are shown, as also specimens of brass fenders, wire fenders, rat and mouse traps in a number of patterns, and various descriptions of galvanised wire lattice, wire snow-guards, &c.

James H. Tozer & Son, Botolph House, 10 Eastcheap, E.C., have a two-page circular giving a pictorial and letter-press exposition of the advantages of Tozer's patent "balancing car," the chief advantages of which are that it is practically impossible for the child to be thrown out, and that the car balances itself whether occupied by one child or two, thereby removing all weight from the arm of the person propelling it.

Mr. William Whiteley (late Thomas Wilkinson & Son), Sheffield, invites attention by means of a two-page circular to the specialties in tailors' shears, tailors' scissors, and small-cut or button-hole scissors manufactured by him. The illustrations are carefully drawn, and indicate with exactness the shape and style of the different patterns supplied.

F. Whitfield & Co., 66 Holborn Viaduct, E.C., and Oxford Street, Birmingham, give illustrations of their wrought-iron fire and thief resisting safes on a two-page inset, printed on white paper. The chief patterns referred to are the "City" safe, made in about eight sizes, ranging from 24 inches by 18 inches by 18 inches up to 54 inches by 30 inches by 26 inches, and the "Office" safe, made in six sizes, from 24 inches by 18 inches by 18 inches to 36 inches by 24 inches by 24 inches.

R. & W. Wilson & Sons, Wardour Street, W., insert a four-page list containing a selection of articles from their newly-issued catalogue. The illustrations represent meat-screens and plate-warmers combined, several patterns of baths, various kinds of lanterns, hot-water jugs, jelly and pudding moulds, &c., and a bird's-eye view of the important range of workshops at which the goods are manufactured.

Mr. Joseph Woodhead, Vaughan Works, Bradford, invites attention, through the medium of a nicely-printed two-page inset, to his specialties in fenders, ash-pans, fire-stands, fire shovels and irons, and also to his productions in metallic trunks, boxes, and baths.

Woodhouse & Rawson United (Limited), 83 Queen Victoria Street, E.C., occupy one side of their two-page inset with a selection from their large variety of patterns in porcelain and Lincrusta Walton electric-bell pushes—some of which are extremely pretty and tasteful. On the reverse side are given particulars and drawings of the "Matchless" electric gas-lighter, the "Diamond" dry battery, and the "Diamond" electric bell.

Woodroffe & Co., Albion Ironworks, Rugeley, have a four-page catalogue, printed on cerise paper, containing illustrations of their patent "British" grist-mills, the machines for which the first prize was awarded at the recent Highland Agricultural Show in competition with several of the leading makers. A page is also devoted to illustrating and describing the "Albion" vertical steam-engines as provided with improved governor and vertical cross-tube boiler.

Cement-making in the Far East.—Consul Alabaster, writing from the Portuguese settlement at Macao, on the Chinese coast, states that a cement factory, under supervision of efficient persons, has been established within the last year or two by means of capital raised in Hong-Kong on Green Island, in the Inner Harbour, and the work done seems to be considerable. The company is practically an English concern, as the supervision is under Englishmen, and most, if not all, of the shareholders are English. There is every hope that, as soon as the good quality of the cement is established, and a hold on one or two markets is obtained, the export will amount to a large quantity. These hopes are not futile, as the cement produced here can be laid down in Hong-Kong at a cheaper price than cement imported from Europe, and as in Hong-Kong and Kowloon alone the works and buildings in course of execution are of such a scale as to necessitate a large consumption. The company has been of late exerting itself to induce the Surveyor-General of Hong-Kong to inspect the works and cement in the hope that a favourable report from an influential source will have the required effect of extending the business and of recommending the cement. This request has, I understand, been acceded to, and the inspection is to take place shortly. The success of this industry will not only benefit the shareholders interested, but will be a boon to the shipping and trade of Macao.

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NEW COMPANIES.

Service & Co. (Limited).—Registered with a capital of 6,000*l.*, in 5*l.* shares. Object, to carry into effect an agreement made September 5 between John Snawdon of the one part and Samuel Hugh Duff of the other part, and to carry on at 4 The Octagon, Plymouth, Devon, the businesses of wholesale and retail ironmongers, mechanical engineers, &c.

Whitfield, Hodgsons & Brough (Limited).—Registered with a capital of 10,000*l.*, in 10*l.* shares. Object, to acquire the business of Charles Whitfield, Union Street Ironworks, Kettering, mechanical engineer, in accordance with an agreement made between Charles Whitfield and J. E. Hodgson.

N. Hingley & Sons (Limited).—The following circular has been issued. The capital, as already stated, is fixed at 250,000*l.*, the whole of which has been privately subscribed: "Netherton Ironworks, Dudley, September 8, 1890. SIR,—Having registered our firm as a limited company, we beg to inform you that we shall in future carry on business under the style of "N. Hingley & Sons (Limited).' This change has been effected for private reasons, the interest and management remaining as heretofore.—We are, yours faithfully, N. HINGLEY & SONS."

Burys & Co. (Limited).—Registered with a capital of 89,660*l.* in 10*l.* shares. Object, to acquire and take over the business of Burys & Co. (Limited), incorporated in 1865; to carry on the business of steel converters, refiners, and manufacturers of locomotive engines, &c. The first subscribers (who take one share each) are:—F. Fowler, St. James Street, Sheffield; W. Armistead, Great Shelford, Cambridge; R. W. Crudelius, Leith; T. Brown, Glossop Road, Sheffield; G. Heath, Grove Terrace, Higher Broughton; J. Hawley, Wharncliffe Villas, Wadslay, near Sheffield; J. T. Miller, Roslin Road, Sheffield.

North British Boiler and Machinery Insurance Company.—Registered with a capital of 75,000*l.*, in 1*l.* shares. Object, to insure against damage arising from explosion of steam-boilers and the breaking-down of steam-engines, with the buildings and machinery of the works in which these are set, the policy of the company covering loss of every description to the extent insured; to periodically inspect and report on the condition of steam-boilers and steam-engines, and advise as to their management, and as to the most recent developments of engineering science; to advise as to boilers, engines, and other engineering structures; surveying the manufacturing of all kinds of plant having relation to, or required in, engineering structures, comprising the testing of the various metals used in connection therewith; to carry on the business of general consulting engineers in all its branches, to insure employers against claims made against them at the instance of their employés under the Employers' Liability Act and at common law; to purchase the goodwill or any interest of any trade or business of the same nature; to carry on the business of engineers and boiler-makers and repairers of engines and boilers. The first subscribers (who take one share each) are:—R. Moore, C.E., Claremont Gardens, Glasgow; R. Sharp, Coatbridge, iron merchant; J. C. Adamson, Airdrie, engineer; R. Highgate, Shettleston, Glasgow, engineer; A. MacLay, Bath Street, Glasgow, professor of engineering; G. Stevenson, Onslow Drive, Denniston, Glasgow, consulting engineer; S. Fowlis, Hope Street, Glasgow.

Elmore's French Patent Copper depositing Company (Limited).—Registered with a capital of 200,000*l.*, in 2*l.* shares. Object, to enter into and carry into effect an agreement which has already been prepared and is expressed to be made between Elmore's Foreign and Colonial Patent Copper-depositing Company (Limited), of the first part, Woodhouse and Rawson United (Limited), of the second part, and the company of the third part, to carry on in France and elsewhere, at such places as the directors of the company shall think fit, and whether as principals or agents, the business of manufacturers of and dealers in copper and other metals, and all metallic alloys or compounds of the same, and all goods and articles made of copper or other metals and alloys; to carry on the business of supplying electricity in all its branches, and in particular to erect or acquire any works or other structures requisite or convenient for the purposes of the companies, and to carry on the business of electricians, electrical contractors, electrical mechanical engineers, and suppliers of electricity, and of manufacturers and dealers in all apparatus required for or capable of being used in connection with the generation, distribution, supply, accumulation, and employment of electricity. The first subscribers (who take one share each) are:—A. L. Broekman, the Avenue, Brondesbury; T. E. Marsh, Reighton Road, Clapton; G. Neath, Queen Victoria Street; S. Rentell, Vassall Road, Brixton; J. Mumford, Trinity Square, S.E.; J. Moore, Norrey Road, Putney; F. D. Summers, Berwick Street, S.W.

COMPANIES' REPORTS AND DIVIDENDS.

[Secretaries of Companies, &c., are requested to send us copies of their reports and balance-sheets immediately they are ready for being issued.]

Die Werkzeugmaschinenfabrik "Union," vormals Diehl Chemnitz, will pay a dividend of 10 per cent., as against 6 per cent. for the previous year.

Görlitzer Maschinenbau Anstalt.—A dividend of 13 per cent. has been declared for 1889-90, as against 10 per cent. for the previous year.

Gussstahlwerk, Witten.—The results of the year's working are sufficiently good to justify, after ample amortisation, &c., the payment of a 15-per-cent. dividend, as against 11 per cent. for 1888-89.

The Bengal Iron and Steel Company (Limited) have declared an interim dividend for the half-year ending March 31, 1890, at the rate of 8 per cent. per annum, payable on September 19.

Société anonyme des laminoirs de l'Ourthe, à Sauheid-Chênée, Belgium.—The dividend for 1889-90 is 55f. per share, equivalent to 7½ per cent. per annum. A sum of 15,000f. has been carried to reserve, and the amortisation charges have been sufficiently provided for.

Wissener Bergwerke und Hütten.—After providing amply for amortisation and other precautionary claims, the balance in hand from the past year permits of the payment of a dividend of 6 per cent. For the previous twelve months no dividend was distributed.

Forges de la Providence, Belgium.—For the year ending June 30 the production amounted to 166,000 tons of pig iron and 102,000 tons of finished iron and steel. The invoiced value of goods sold (excluding the output of the mines) was 20,446,000f. The net profit stands at 1,762,448f., and a dividend is proposed of 12½ per cent.

Société anonyme de Grivegnée.—The gross profit for 1889-90 made by this concern, which owns and works coal-mines, blast-furnaces, puddling-works, forges, and constructional shops is returned at 670,059f., 369,500f. of which has been distributed amongst the shareholders as a dividend of 50f. per share.

Prager Eisenindustrie Ges.—The Teplitz Rolling-mills, belonging to the above-named company, earned a net profit during 1889-90 of 342,788fl., as against 247,758fl. for the previous year. Of this sum it is proposed to distribute 292,500fl. as dividend at the rate of 13 per cent., the same rate as last paid by the Prager Company itself.

Rima-Muranyer Eisenwerke.—The results for 1889-90 are unusually favourable, the net profit showing a dividend of 21 per cent, as against 8 per cent. for 1888-89. Only some 11 or 12 per cent. will, however, be distributed, the

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balance being partly applied in strengthening the reserve fund and partly carried forward to the next account.

The Laurium Lead-mining Company, Greece, raised during the first half of 1890 4,300 tons of lead, valued at 2,175,350 drachmes (say 87,000*l.*) The working expenses having been 1,763,201dr., the gross profit stands at 412,146dr. plus 8,040dr. derived from other sources. The net profit amounts to 117,720dr., and after deducting Government duty of 50,272dr., admits of the payment of 5·50dr. per share of 500dr. each.

Eisenindustrie zu Menden u. Schwerte.—The net profit of the last-closed financial year was 485,202m., as compared with 289,232m. for the previous twelve months. For the erection of new Martin steelworks the share capital has been increased by 1,375,000m. Although this new capital is not really productive at present, the directors propose to allow it to rank for dividend, and to pay, therefore, 9 per cent. on the preference and 8 per cent. on the ordinary shares, carrying forward 43,000m. to the next account.

D. Hulett & Co. (Limited), High Holborn, W.C.—The directors made their first annual report a few days ago, the accounts being made up to the end of June, 1890. The profits of the year, after payment of all expenses, including an extraordinary item of nearly 2,000*l.* for alteration of premises, new plant, &c., besides making provision for bad debts, depreciation of fixtures, &c., amounted to close on 3,000*l.* A dividend of 6 per cent. was declared, free of income-tax, and the balance 1,227*l.* 0*s.* 9*d.* carried forward.

The Pearson & Knowles Coal and Iron Company (Limited) report that the net profits for the year ending June 30 last amount to 75,400*l.* 13*s.* The interim dividend, paid in March last on the A shares absorbed 6,367*l.* 14*s.* 6*d.*; the dividend on the B shares, 14,905*l.* 6*s.* 3*d.* The directors recommend that the usual dividend at the rate of 6 per cent. per annum be paid on the A shares, and a dividend of 50*s.* per share on the B shares, leaving a sum of 24,108*l.* 4*s.* 9*d.*, out of which the directors recommend that 10,000*l.* be added to the depreciation fund and 8,000*l.* to the reserve fund.

Maschinenfabrik Augsburg.—For 1889-90 a dividend has been declared of 18⅔ per cent., as against 23⅓ per cent. for 1888-89. In addition 50,000m. will be applied to the reserve fund, and 347,089m. to the extra sinking fund. The total sales for the year reached 6,720,000m. The works are well employed at present on remunerative contracts, and, looking to the fact that the statutory reserve fund stands at 1,500,000m., and the special reserve at over 1,000,000m., the concern appears to be in a thoroughly satisfactory and solid condition.

Sheepbridge Coal and Iron Company (Limited.)—The amount of profit made by this company during the year ending June 30 last is 90,206*l.* 12*s.* 8*d.* After allowing 16,562*l.* 8*s.* 3*d.* for interest and depreciation, and including the balance of 2,658*l.* 1*s.* 8*d.* from last year, the net profit is 73,644*l.* 4*s.* 5*d.*, which is reduced to 56,987*l.* 18*s.* 7*d.* by the interim dividend paid last February. This sum the directors recommend shall be appropriated as follows:—Payment of a further dividend of 25*s.* each on the "A" shares, 10*s.* on the "B" shares, and 12*s.* 6*d.* on the "C" shares (making 7½ per cent. for the year)—30,208*l.* 2*s.* 6*d.*; to place to the reserve fund 21,310*l.* 19*s.* 3*d.*, which fund will then amount to 70,000*l.*, and to carry forward the balance of 5,468*l.* 16*s.* 10*d.*

Verein deutscher Oelfabriken, Mannheim.—The report for 1889-90 shows a further diminution of profits, 636,778m. net, against 692,039m. for 1889-90. The dividend will be 6 per cent., as compared with 6½ per cent. for the previous year. The report states that the conditions of the oil industry were much less favourable than during 1888-89, owing to the small harvest, the poor condition of the seeds, and their unsatisfactory yield of oil. The quantity of oil disposed of was about equal to the average of the last year or two, but prices were less remunerative. The report complains of the continued increase in the importation of American cotton-seed oil, a trade which the low import duty is considered to unduly favour. For 1889 the imports were 30,000 centners higher than for 1888, whilst for the first half of 1890 alone the increase is estimated at 100,000 centners.

Ingall, Parsons, Clive & Co. (Limited).—The adjourned annual meeting of Ingall, Parsons, Clive & Co. (Limited), coffin-furniture manufacturers, representing eighteen amalgamated English and Scotch firms, was held on Monday, in Birmingham, to receive the report of the committee of investigation. Mr. W. G. Ingall presided, and the large assembly-room of the Queen's Hotel was densely crowded, shareholders being present from Leeds, Sheffield, Manchester, and other parts of the country. The committee reported that in the prospectus the annual profit was put at 65,000*l.* a year, whereas the largest ascertained profit was 27,000*l.* Certain vendors had agreed to allow half the amount they had received for goodwill to be set back as deferred, as to capital permanently, and as to dividend until 6 per cent. was paid on the ordinary shares; but several other vendors, including the Scotch Coffin-furniture Company, refused to accept this agreement. The sum thus set back amounted to 106,000*l.*, out of the 300,000*l.* paid for goodwill, and would reduce the preference dividend by 2,300*l.* a year. Ultimately the report was adopted with a few dissentients.

Staveley Coal and Iron Company (Limited).—A general meeting of the shareholders of the Staveley Coal and Iron Company (Lim) was held at Sheffield on Sept. 11, Mr. H. D. Pochin presiding. On the motion of the chairman, seconded by Mr. Markham, the report of the directors was adopted, recommending the payment of a final dividend for the year ended June 30, 1890, of 4*l.* per share on the A shares (100*l.* shares, 60*l.* paid), 13*s.* 4*d.* on the B shares (100*l.* shares, 10*l.* paid), 4*l.* on the C shares (60*l.*, fully paid), and 13*l.* 4*s.* on D shares (10*l.* shares, fully paid), free of income-tax. On February 10, 1890, the company paid an interim dividend of 3*l.* per share on the A and C shares, and 10*s.* per share on the B and D shares, being at the rate of 10 per cent. per annum. Early in June of this year the shareholders were much surprised by a notice intimating that the directors would, on June 11, pay a further interim dividend of 2*l.* per share on the A and C shares, and 6*s.* 8*d.* per share on the B and D shares. The total dividend on the A and C shares for the year is 9*l.* per share, and on the B and D shares 1*l.* 10*s.* per share, or 15 per cent.

Calderbank Iron and Steel Company (Limited) held its first statutory meeting of shareholders on September 12, in the offices of the company, St. Vincent Street, Glasgow, Mr. J. M. Maclean, M.P., chairman, presiding. The chairman said the company was formed, and the capital fully subscribed, early in June. The calls had been paid up in a satisfactory way, and he had no doubt that the shareholders had observed with pleasure that the directors had already obtained a quotation for the shares on the Glasgow Stock Exchange. Immediately after the formation of the company steps were taken for the erection of the steelworks, and the main machinery contracts had been placed on favourable terms—better terms even than had been looked for when the prospectus of the company was issued. The latest contract would be finished in seven months from the present time, and it was expected that one furnace would be at work in the beginning of December, and turning out finished steel at the commencement of the new year. Within seven or eight months from this time—say, at the outside, in May—the works ought to be in full swing. He thought the shareholders would consider that this would be a very satisfactory amount of work to be completed within the first financial year of the formation of the company. With regard to the work that was going on, the foundations of the producers and furnaces were nearly finished, and the mills and engines were well in hand. Several boilers were placed, and the hydraulic machinery was being erected. With regard to the collieries at Tannochside and Monkland, he only required to say that the output and revenue had fully come up to the estimates given in the prospectus. The works for the development and extension of the collieries were being vigorously pushed on, and he hoped that before very long the directors would be in a position to state to the shareholders that the output and the revenue had been largely increased. He hoped that at the end of the financial year the directors would be able to tell the shareholders that they had got steelworks in full operation, which had been completed as economically as any in the whole of the kingdom. The proceedings terminated with a vote of thanks to the chairman.

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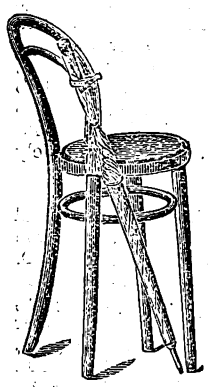
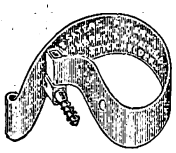
NOVELTIES.

SAYER'S UMBRELLA AND WALKING-STICK HOLDER.

It is confessedly a difficult thing to know what to do with an umbrella or walking-stick whilst in restaurants, shops, or public buildings where proper arrangements for the secure custody of these articles are not in force. In the rare instances where umbrella-stands are provided the risk of losing one's property is considerable, owing to the difficulty (and nuisance) of keeping the stand in

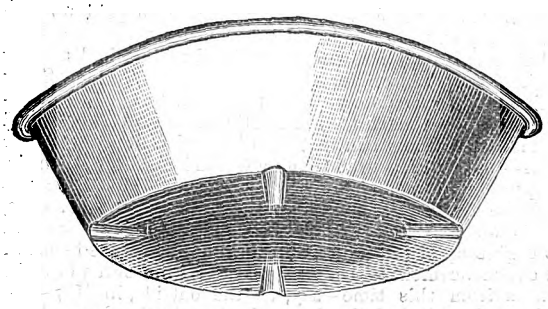




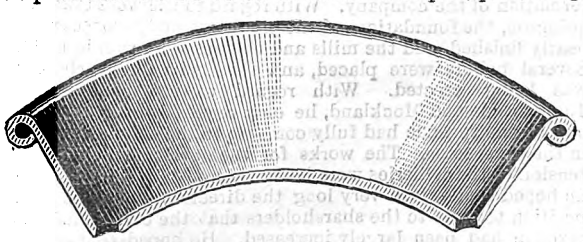
view. An effort to overcome this inconvenience has been made by the inventor of the little article here shown. It consists merely of a strip of spring steel bent to the shape shown, and provided at one end with a loop for the reception of a short screw-peg for driving into the woodwork of a chair or table, or whatever it may be convenient to fix the holder to. If properly fitted, the holder presents no sharp edges to catch against clothing, and it is not large enough to be unsightly, whilst offering complete facilities for retaining the articles consigned to its care. May & Padmore, Birmingham, are the makers.

AN IMPROVED PATTY-PAN.

An improved patty or tart pan is being placed on the market by Fisher & Ludlow at their new works, Rea Street, Birmingham. It is simple in design, the bottom being raised in the stamping, and also slightly grooved, thus allowing a current of air to pass underneath. The advantages claimed



are that the heat in all parts is uniform, and there is, consequently, no danger of the contents being burnt. It also helps to raise the lids of covered and mince pies, preventing



the centre from sinking, and giving at the same time a much better appearance to the pastry. These pans are wired at the edge, thus making a very strong and serviceable article, and are being made in all sizes and shapes, including round, oval, plain, and crinkled.

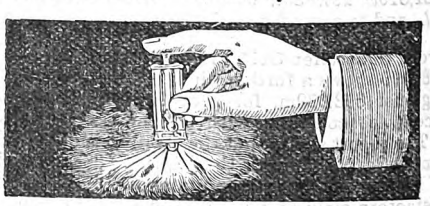
ARTISTIC LAMP-STANDS.

The Midland Lighting Company, Stanhope Street, Birmingham, are introducing, amongst other new season goods, some exquisite designs in the style of Louis XV., which display the excellent workmanship of this firm to great advantage. These lamp-stands may be used during the day or when not otherwise required as jardinières for flowers or ornamental

grasses, and as such are most effective when fitted with opalescent fluted vase and corona. Another season novelty with this firm is a pillar-lamp, with art-metal mountings and decorated porcelain bases of varied patterns.

A MATCH-MAGAZINE.

Perry & Co. (Limited), Holborn Viaduct, E.C., are introducing a handy contrivance for obtaining a light, and being convenient for the pocket, smokers and others will doubtless readily perceive its merits. In the cylinders a number of



pellets are stored, which perform the functions of the ordinary match, each pellet burning about half a minute. The easy way in which the magazine is charged, made ready, and fired, is not the least of its attractions as a saleable article, and as it is declared to be perfectly safe to carry, the new contrivance ought to have a good run. When the magazine is exhausted pellets are supplied at a cheap rate.

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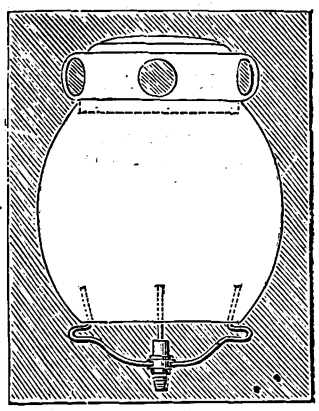
THE "SIAM" CORONET.

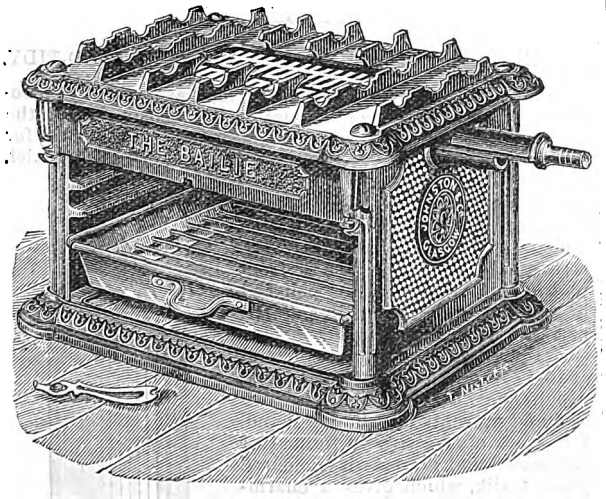
It is claimed by E. J. Shaw & Co., the patentees of the "Siam" coronet, of which an illustration is here given, that it is the only smoke-preventer yet devised. It is made entirely of opal glass, annealed so as to stand any amount of heat without breaking, whilst at the same time in no way interfering with the diffusion of light as metal coronets do.



It is further asserted by the makers that under ordinary circumstances it remains clear, white, and brilliant in use. Should it, however, by any mischance become smoky, the deposit can be washed off in a moment. By using this new coronet all smoking of ceilings, it is averred, may be completely avoided.

THE "BAILIE" GAS-COOKER.

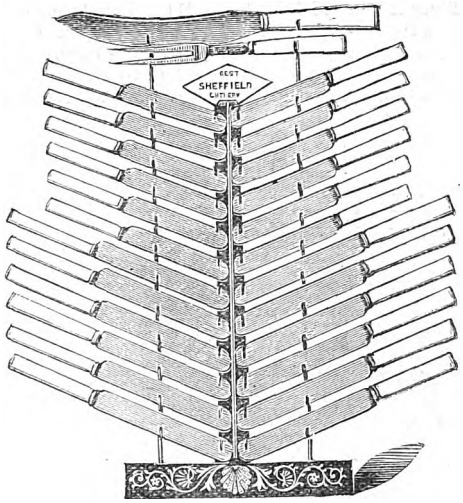
The portable gas-stove here illustrated is being placed upon the market by J. Johnston & Co., 32 York Street, Glasgow. Its construction is thoroughly strong and reliable, the top and bottom plates being continuous all-round castings, held together along with the sides and back by four strong bolts passing from top to bottom. The burner is arranged so that a solid flame from each side is produced, and the deflector



admits of regulating the heat upwards and downwards to any extent desired. A considerable improvement is effected in the cooking powers of the "Bailie" by the introduction of two plates to the front, one of which can be dropped down or raised, so as to admit more or less cold air as may be wanted. The makers claim that the continuous flame gives much greater heat than the ordinary type of burner, and that, owing to its being regular and uniform, it will cook more quickly and thoroughly than other forms of gas apparatus.

"EXHIBITION" KNIFE-STAND.

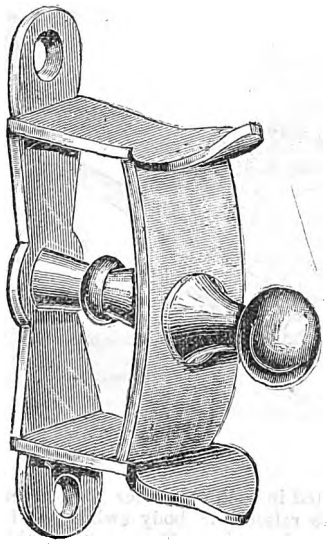
Mr. T. G. Blood, Great Hampton Street, Birmingham, has added another pattern to his existing and ingenious stands for displaying cutlery. The new article is termed the "Exhibition" stand, and from the drawing here given it will be seen that, unlike anything yet devised, it enables the knives to



be well displayed, without causing the handles to get soiled by coming into contact with the stand itself. Provision is moreover made for exhibiting a pair of carvers, thus forming a welcome addition to the show-case or shop-window. A card can also be fixed on the top, as represented in the illustration.

PATENT TOWEL-HOLDER.

Sanders, Son & Payne (Limited), Leopold Street, Birmingham, have brought under our notice a novelty in the shape of a patent towel or handkerchief holder, the shape of which permits of any material, however delicate, being inserted between the front rubber-band and the projecting ear. So



free from liability to catch is the holder that articles may even be snatched away without any risk of tearing or other injury. These patent holders should be specially useful in ships' cabins, lavatories, and other places where space is limited. Two articles can be held by using the top and bottom of the holder. They are well finished in brass, and the best rubber is inserted. It is styled the "R.V.R." patent holder.

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A BALANCING CAR.

ALTHOUGH the number of designs in that highly popular article, the mail cart, is sufficiently great to be almost bewildering to a buyer not fully conversant with the special points of advantages claimed for the respective patterns, there is to be added another design, made to the patent of J. H. Tozer & Son, 10 Eastcheap, E C. This latest candidate for the suffrages of the youngsters possesses several distinctive features which, there can be little doubt, will be readily appreciated not only by the bairns but by those who have to propel the car. A first glance gives the impression that the

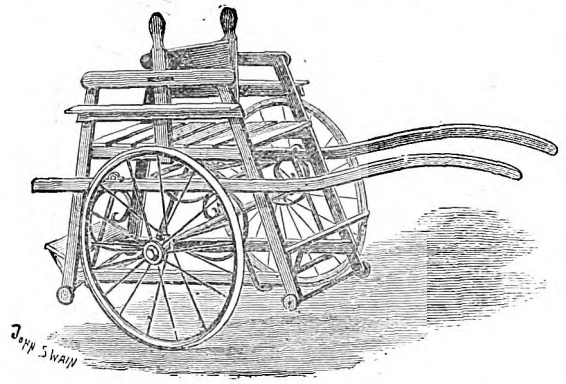


FIG. 1.

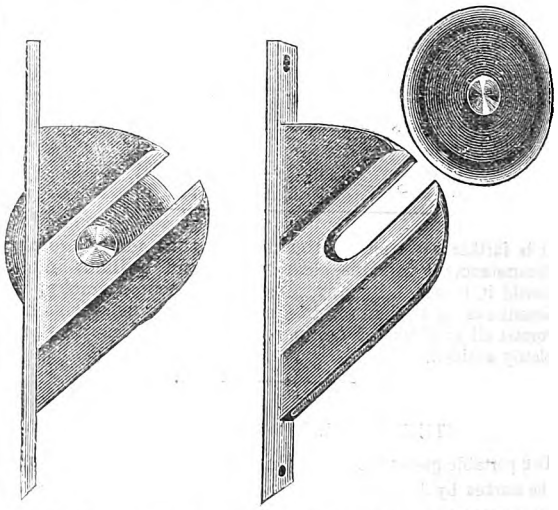
general appearance does not differ from the majority of cars already in use, but the difference becomes obvious immediately the car is examined. Instead of its being a stiff, rigid construction, it is made in two parts—viz, one part comprising the shafts, sides, and wheels, and the other part the body in which the juveniles are placed. Connection between the two parts is made by four strong iron cranks, two placed at each side, as seen against the wheels in fig. 1, which illustration rep esents the car balanced at rest. These

FIG. 2.

cranks are fitted in such a manner that, no matter how high the shafts are raised, the body swings, and to all intents maintains a level position. The merits of this arrangement are that the occupants of the car, and especially the one with its back to the driver, cannot be tipped out, and also that when the car is running over rough or uneven ground, or when it is being lowered from or raised to the pavement, the inevitable jerking does not affect the children, as the body simply swings. Another important point is that the car readily adjusts and balances itself, whether one or two children are riding, as shown in fig. 2, so that practically there is no weight upon the hands of the person pushing, and, as the shafts are curved, they may be comfortably taken hold of by either a child or a grown-up person, and the car easily driven. It must be further observed that, although the body swings, its movement either backward or forward is limited, so that lively children cannot get into mischief or hurt themselves, and also that small wheels are placed below the back and front ends of the frame with the object of preventing an accident should the lower portion of the body touch the ground suddenly or otherwise, for, of course, as soon as the wheels touch the ground they immediately come into play.

THE "ECLIPSE" AXLE-PULLEY.

THE accompanying illustrations refer to an improved axle-pulley now being placed upon the market by Hawkins & Co., Crown Foundry, Dudley Port. It consists of only two pieces,



viz., the frame and wheel; and the latter can be removed when fronts are painted or a new cord has to be inserted. The wheel can also be readily renewed if damaged. There are no parts to get out of order, simplicity of construction and good finish being the leading characteristics of the new article.

WINFIELD'S PATENT POCKET OR BEDSTEAD-TIDY.

WINFIELD'S (LIMITED), Birmingham, have recently introduced a handy appendage for use on iron bedsteads. In the ordinary French bedsteads there is no convenience for attaching a watch or even hanging up a pocket-handkerchief. Winfield's patent pocket or bedstead-tidy not only supplies the lack, but affords a method of decoration which will readily commend the article to ladies. The face or front part of the tidy is made of polished brass in several designs to suit the pattern of the bedstead, having either an ornamental watch-stand at its head or a flat-bottomed hook, which holds the watch in its position and prevents it swinging round. The back of the tidy is formed of perforated zinc, draped with coloured pleated silk, which gives a charming finish to the bedstead-head. The draped back can be easily removed by merely turning a small thumb-screw, which holds it in position, so that the drapery can be replaced at will at a very trifling cost. These useful articles are made with either French, half-tester, or Persian bed-steads, and will, doubtless, be found useful for many other purposes than those here referred to.

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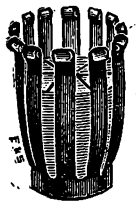
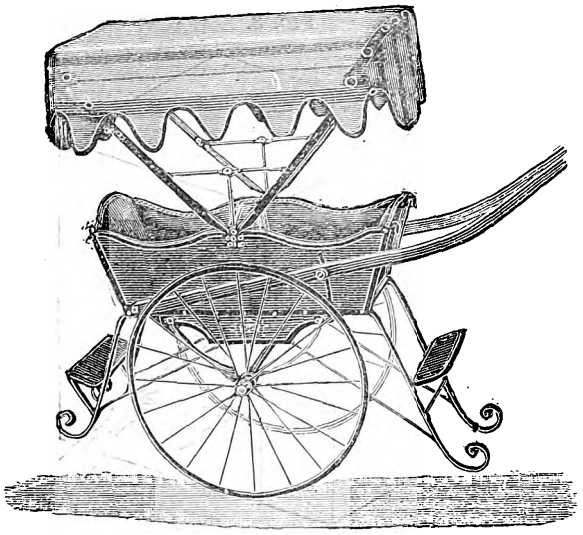
PATENT CANDLE SAVE-ALL.

FURSE & SIMMONDS, White Street, Finsbury Pavement, E.C., are introducing to the trade a patented device, styled the "Beatrice" save-all, for securing candles in candlesticks. The illustration depicts the contrivance, and it may be described as an annular series of claws which grip the candle, the grip becoming tighter the more it is pressed into the candlestick. The article is made of stamped brass, and its simplicity of action is commendable.

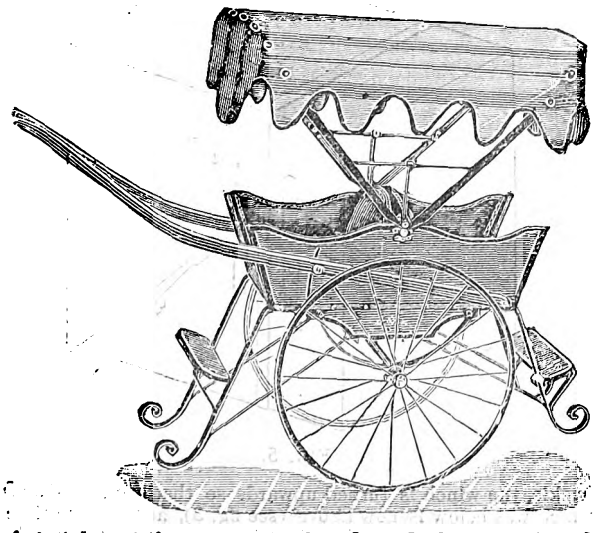


CONVERTIBLE MAIL CART AND BASSINETTE.

THIS vehicle, a specialty of the Halesowen Perambulator and Carriage Company (Limited), Halesowen, near Birmingham, offers an easy and simple method of converting a mail cart



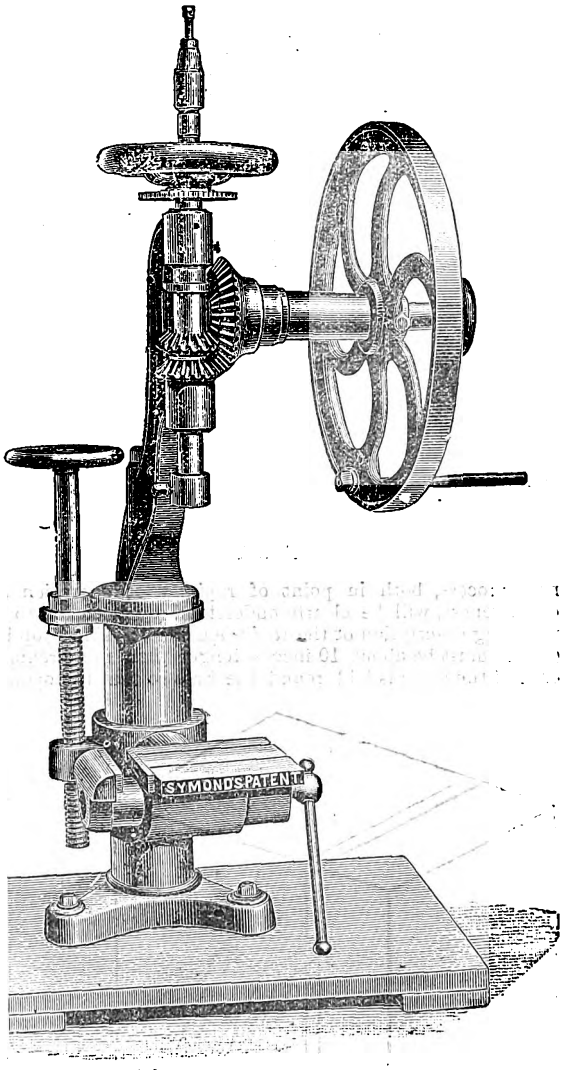
into a bassinette, or *vice versâ*, thus rendering it equally useable by children or adults. All that it is necessary to do to change the vehicle from its mail cart form to a bassinette



is to take out the two centre boards and place one at each end. The hood or canopy is fixed and immovable when up, and no straps are required. The handles or shafts are adjustable by means of a fly-nut. The design has been registered, and the demand for the new article is already very favourable.

SYMOND'S VARIABLE-SPEED, SELF-FEED DRILLING-MACHINE.

THE object of the inventor of this machine has been to combine in one tool both speed and power. The ordinary small machine and ratchet-brace has but one speed for large and small drills, whereas with the patent drill the speed can be altered instantly by a few revolutions of a small wheel at the end of the driving-spindle. It is claimed that by applying the rapid-speed motion when drilling small holes, double the quantity of work can be produced by it than can be turned out by machines with a single pair of mitre wheels in the same



given time; and, further, that by applying the power-speed motion, holes can be drilled quite ¼ inch larger in diameter than can be drilled by the old mitre-wheel machines of the same weight and capacity. The most expeditious way to use the machine when large holes are required is to drive a first hole through the work with the rapid gear, and then apply the power gear to the larger drills. Single-gear machines of the old patterns can in most cases be fitted with the patent gearing. The machine shown is fitted with vice and table combined, of entirely new design, and can be set to any angle. It rises and falls with screw-motion, and swivels on a turned pillar. G. Fowles & Son, River Foundry, Birmingham, are the makers.

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BINDING-WINCH FOR HAND-BALING.

An apparatus for baling certain kinds of goods by hand, designed for use where power is not available, is being placed upon the English market by H. Pückert & Co., 110 Cannon Street, E.C. It has been the practice hitherto to close up hoop-iron bands by means of clinched nails, a process involving much waste of time, and at best only imperfectly tightening the hoop round the bale. The merits of the

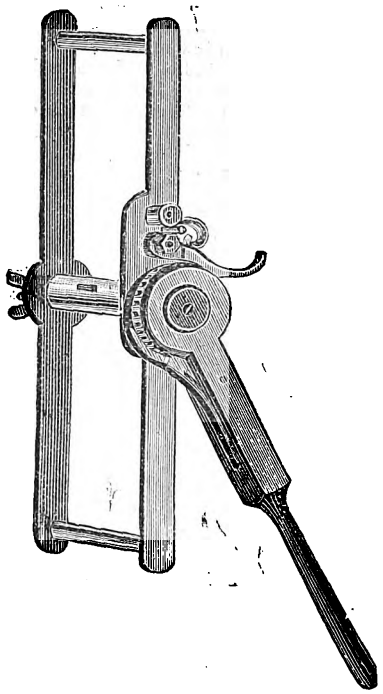

Fig. 1.

new process, both in point of rapidity of operation and effectiveness, will be clearly understood by attention to the following description of the *modus operandi*:—The hoop iron (which must be about 10 inches longer than the circumference of the bale) is laid round the bale so that the operator

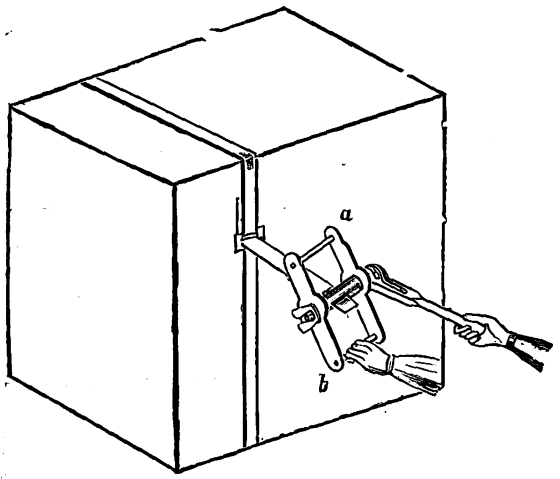

Fig. 2.

has the two ends before him. The upper end is then turned inwards so as to form a hook on which to hang the hoop-iron buckle. The under end is then passed through the hoop-iron buckle from the inside (see fig. 2). This under end is next run through the slit of the binding-winch cylinder, so that the hoop iron passes below the cross-bar *a* (see fig. 2). The under hoop iron end can thus be wound round the binding-winch cylinder, drawing the upper cross-bar of the winch up to the buckle. The cross-bar *a* having nearly reached the

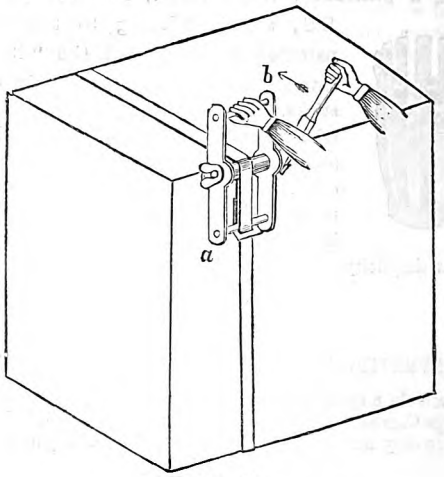

Fig. 3.

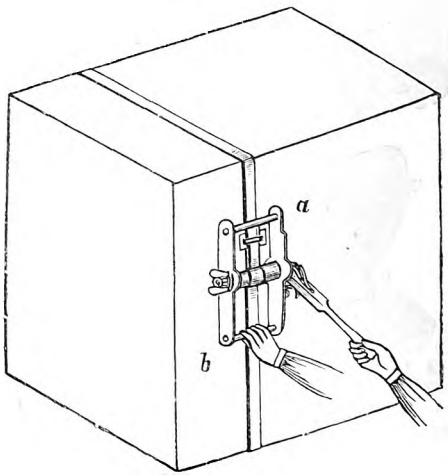

Fig. 4.

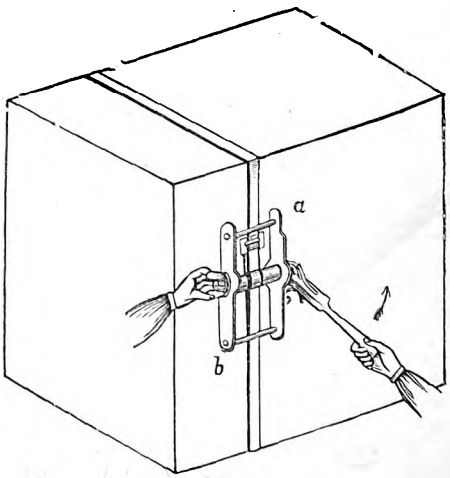

Fig. 5.

buckle, the winch is turned upwards so that the cross-bar *b* which was below is now above (see fig. 3), at the same time moving the lever to and fro with the right hand; the winch, when pressing, works in the direction of the arrow, the upper cross-bar *a* resting against the buckle. Having brought the

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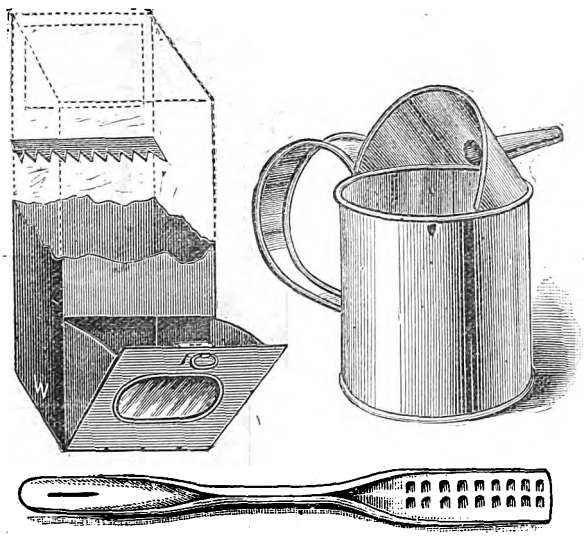
hoop iron ends together in this manner, grasp the cross-bar *b*, forcing the winch downwards with a semi-circular movement, so as to bring the winch into the position indicated in fig. 4. The winged nut must now be held firmly by the left hand, at the same time pressing the knee against the cross-bar *b*, and forcing the lever with the right hand in the direction of the arrow (see fig. 5). This done, a shutting-latch will be moved out, and the cylinder can be reversed by means of the winged nut, thus unwinding the hoop iron. The winch having been laid aside, the one remaining end of the hoop iron is cut off within an inch, and turned up to be finally fastened either with packthread or a strip of tin. The union thus effected is thoroughly reliable and secure. Unless hammer and chisel are used it is impossible to open the bale.

SAFETY LETTER-BOX, OIL-CAN, &c.

R. W. Wilson & Sons (Limited), Wardour Street, W., have brought out several features, three of which are illustrated. The patent letter-box is devised to baulk the efforts of certain ingenious individuals who seek to abstract

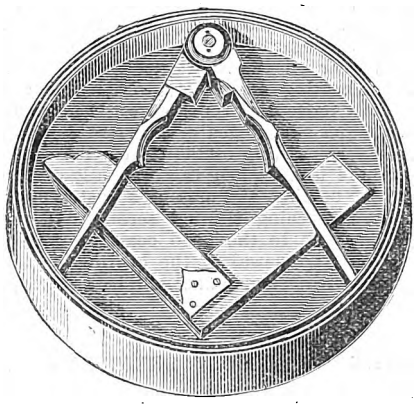


letters therefrom. An inner serrated plate is arranged to prevent "fishing" with a piece of string or wire. It is claimed that the guard fixed inside the letter-box below the door-slit, as shown in the engraving, guarantees immunity from robberies of this kind, and as its cost is merely nominal, the new letter-box will, no doubt, have a ready sale. The patent measure and funnel combined will commend itself to the attention of oil-users as well as dealers, its usefulness for

filling lamps as well as measuring oil making it a very acceptable adjunct. The smallest engraving depicts a julienne cutter, which is a cheap line, one end being adapted for scraping vegetables for soup, the other being useful for peeling apples and potatoes without waste.

MASONIC ASH-TRAY.

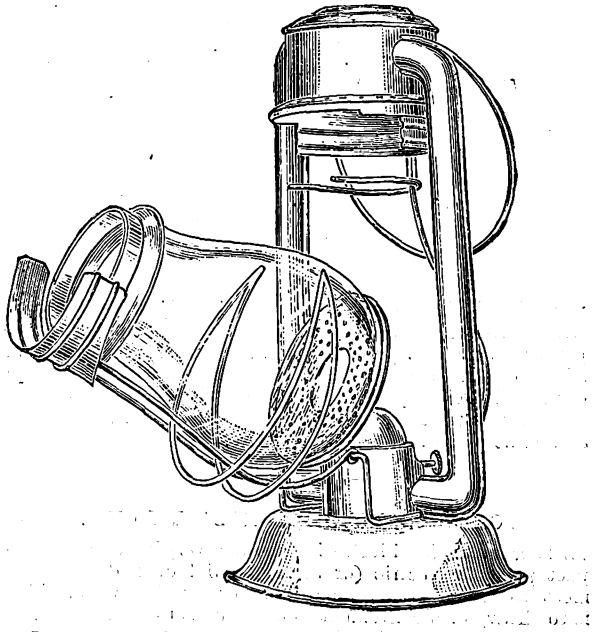
A little article, designed to strike the fancy of members of the craft of Freemasonry is brought under our notice by George Woolliscroft & Son, Patent Tile-works, Hanley. It consists of a circular ash-tray, about 4 inches in diameter, upon the upper surface of which, and standing out in bold relief, are the Masonic emblems of compass and square. The



trays may be had in cream-coloured ware, with gold or blue rim; with pale or dark Masonic blue ground, and gold rim; or with cream ground, and gold or silver compass and square. The idea, which originated with a leading Mason until lately Grand Treasurer of England, is one that the fraternity are likely to appreciate, and it is claimed that ironmongers will find the goods thoroughly saleable.

THE "PILOT" HURRICANE LANTERN.

In this patent lantern the protecting hood is so arranged that all down-draught is prevented, whilst at the same time a large, clear, and bright flame in any wind is ensured. The patentees assert that the lamp will burn under all conditions of weather, and that it is unsurpassed in point of durability



and as regards the ease with which the globe can be taken out and replaced. An advantage which users generally will not fail to appreciate is that the "Pilot" lantern requires no special globe. It is a strongly made and well-finished article throughout. Edward J. Shaw & Co., Astral Works, Walsall are the manufacturers.

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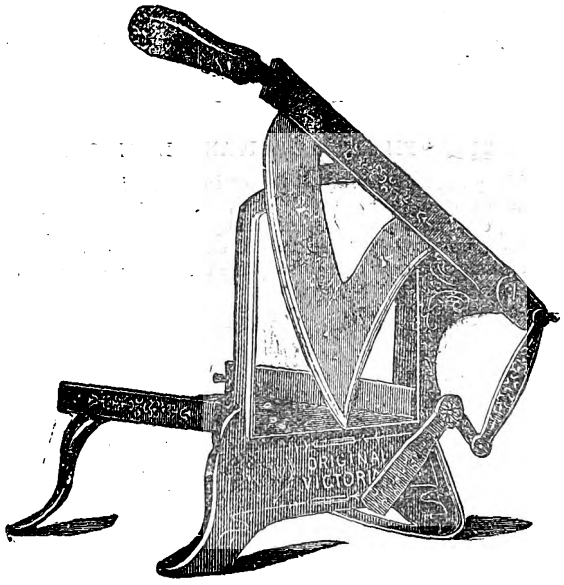
IMPROVED BEARINGS.

Mr. J. C. Dalman, Church Foundry, River Street, Birmingham, is introducing an improvement in machine-bearings, as applied to polishing planes, fans, emery-machines, &c. They are styled Dalman's patent adjustable cone-bearings, and have been severely tested on spindles running at considerably over 2,000 revolutions a minute. The important advantages claimed are, that owing to their construction there can be no possible wear whatever on the spindle, as the inner cone or section of this bearing is fixed on to the shaft, thus preventing any wear on the shaft itself. The outer cone or section of the bearing fits closely over the inner fixed cone, thus effectually preventing the slightest wear on the head of the lathe. Other advantages are, perfect steadiness in the running of the spindle, no oscillation or vibration, and what little wear there is after long use is equally distributed over all parts of the bearing, and may be adjusted by an ordinary workman by slackening the set screws, and pressing the adjustable cones on to the fixed cones on the spindle. In fact, no periodical renewal of the bearings is required, for those supplied with the machine will, it is stated, last for a lifetime.

THE "VICTORIA" BREAD-SLICER.

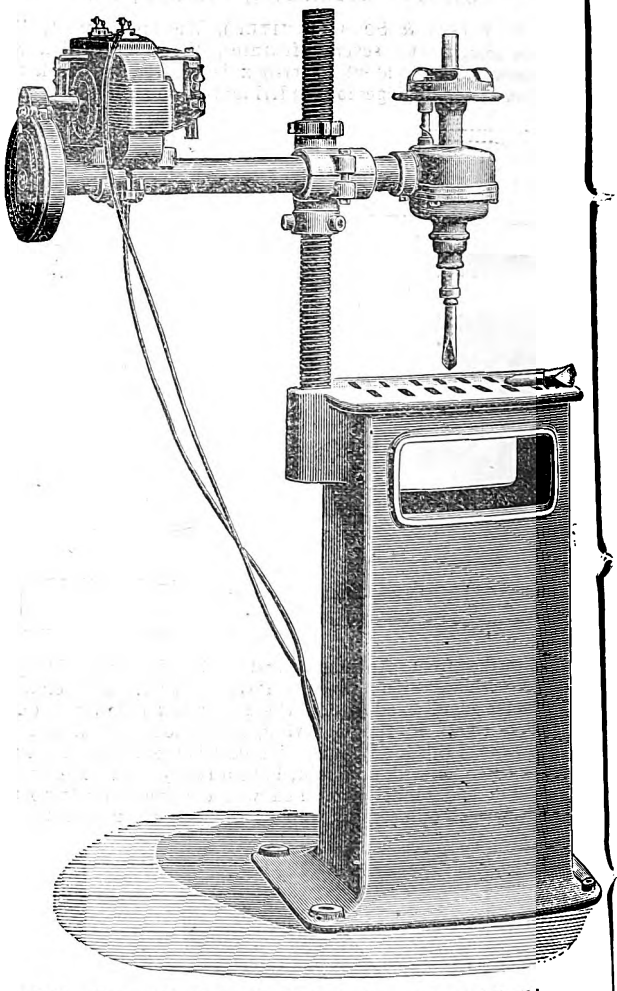
Crowden & Garrod, Southwark Street, S.E., have taken up the sale of the "Victoria" bread-slicer, of guillotine pattern, shown in the illustration herewith. The machine is made of good quality Swedish steel, and the mechanism for regulating the thickness of the slices is connected in an ingenious



way with the handle, so that when the adjustment is made with a set-screw at the end of the rack bread-cutting can be performed in a rapid manner with uniform thickness of slices. It will be observed that the rack falls with the descent of the knife, consequently, on the completion of the cut the slice drops clear of the machine, and can be delivered down an incline plane very readily if desired.

PORTABLE ELECTRIC RADIAL DRILL.

The accompanying illustration shows a very handy and compact portable electric (or power) radial drill, designed to meet the requirements in drilling or tapping work, which is too heavy or inconvenient to be brought to a fixed drill. It is driven by a small electric motor, and can therefore be used in any position, and at any distance from the shop-shaft, whilst the gearing has been carefully designed to give great power in a small compass, combined with a very small loss from friction, and it is almost noiseless in its action, and entirely enclosed. The total weight is a little over 200 lbs., but to facilitate its ready removal or fixing in any position by one man, it is so designed that by loosing two bolts it becomes divided into three pieces, weighing respectively 62 lbs., 63 lbs., and 85 lbs. The pillar which carries the radial arm is, as will be seen, provided with nuts, by means of which it is easy to raise and lower the arm, which can also be swung round into any position without the risk of dropping. The feed for the motion is either automatic or by hand, and the change can be made instantaneously. The machine can drill from $\frac{1}{4}$ to $1\frac{1}{2}$ inch, and one important advantage which it possesses is, that by putting full power on the motor it adjusts itself to the right speed for any size of drill, so that time is not lost by the workmen running too slowly; with a $\frac{1}{4}$-inch drill the machine will run about 300 revolutions per minute, with a $1\frac{1}{2}$-inch drill about 60 revolutions a minute, and the intermediate sizes *pro rata*. Another advantage is that the feed being positive and



invariable, the work done is always the same, and in this respect it is perfectly automatic in its operation, irrespective of the attendant who may be driving. In construction the motor is very strong and simple, possessing no complication that an ordinary mechanic cannot readily understand. All the parts are made to gauge, and can be readily replaced from stock. With a view of making the machine more useful for shops that have not constant work for a "portable," a convenient drill-table has been designed, with a fixed pillar, on to which the horizontal arm, with drill-adjuster, can be lifted. The drill is also arranged to be driven by Taylor's flexible patent tempered-steel shaft, which is made of special tempered flat steel of a suitable section, wound edgewise by special tools and machinery, and so constructed that it will transmit power at any angle. Both the electric radial drill and the flexible shafting, we may add, are introduced by Mr. Tom Taylor, Royal Cycle-works, Manchester.

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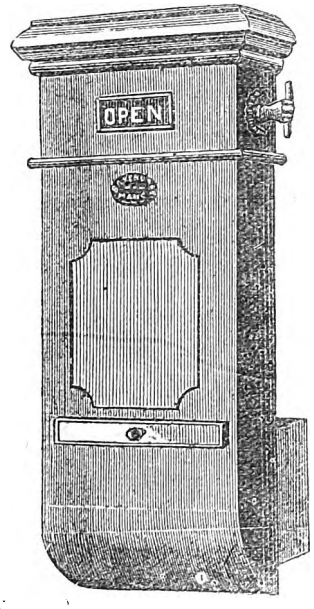
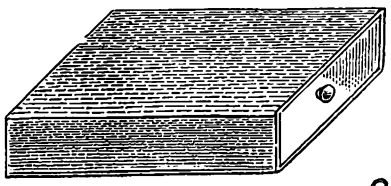
DARRAH'S PATENT WALL-INLET VENTILATORS.

BAXENDALE & Co., Miller Street, Manchester, have introduced several improvements in wall-inlet ventilators, of which we give illustrations. One of these, which consists in attaching an enamelled indicator, showing when the ventilator is open and when it is shut, can be fixed to any of their ornamental patterns, and the indicator is readily operated, as will be seen by the handle on the side. The ordinary ventilator is frequently rendered quite useless by being shut off when it is supposed to be open, the only means of ascertaining the fact for a certainty being by holding the

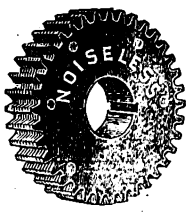




hand over the inlet, which is often difficult of access. This disadvantage, as will be seen, is effectually removed by the simplest possible means. Another improvement which has been introduced is by supplying an air-filter, as well as the enamelled indicator. By means of this all dust or smoke is prevented from entering the room, thus ensuring a supply of pure filtered air, instead of the soot or dust laden air usually passed by ordinary ventilators. This filter is also a very simple contrivance, charged with suitable material. Those who have noticed the discoloration of light wall-papers where the ordinary ventilators are in use will fully appreciate the importance of this improvement, for by it curtains, books, pictures, and furniture are saved from dust and damage. This air-filter can also be charged with disinfectants or perfumes, and thus utilised for health or pleasure.

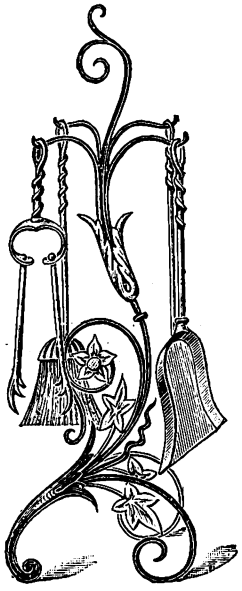
NEWALL'S PATENT NOISELESS GEAR-WHEELS.

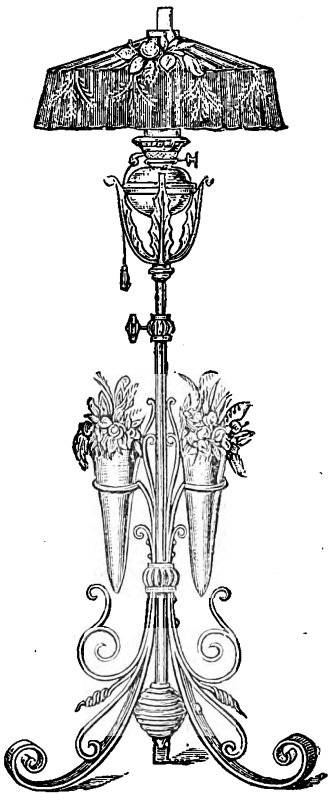
A NEW form of gear, manufactured out of raw hide, of which we give an illustration, is being introduced by Tom Taylor & Co., 31 South Corridor, Royal Exchange, Manchester. The use of raw hide for gears is not new, and for some time it has been known that small gear-wheels made of hide will run silently at high speeds; but the old method of manufacture was found to be faulty in many respects. The patentee has, however, succeeded in perfecting the manufacture of these wheels so that they are practically one piece, no matter what thickness. Another advantage is that by using this material for mortice-teeth, bevel or plain spur-wheels, they can be made of any size. As an illustration showing the strength of the teeth in a wheel manufactured of hide, the flat of a No. 2 Morse taper socket made of steel has been twisted over an angle of 60 degrees by a hide wheel 1¾ inch diameter, with teeth of twelve per inch pitch, without in any way causing injury. The experience of two years' very hard wear with hide wheels working against mild steel shows that the material gets slightly condensed, but that the wear is practically *nil*. For electric machinery, and all small gears running at a high speed, the special properties possessed by the raw-hide wheels are of great advantage, and these wheels have been running very successfully in electro-motors and for silk, cotton-spooling, and spinning machines.



ART BRASSWORK.

MR. THOMAS SMART, Charterhouse Street, E.C., and Dudley, has brought out several new features in wrought iron and brass work, two of which are illustrated. The designs "speak for themselves" as regards artistic merit, the finish is very





good, proving an earnest desire to cater for buyers who have a cultivated taste. Other designs for the season in fenders, fire-brasses, hall-lanterns, gas-brackets, chandeliers, and black and brass goods are equally stylish, and Mr. Price, the London agent, may be congratulated on having at his command goods of such an attractive character.

THE "THRIFT" COMBINED COOKING-STAND AND COAL-SAVER.

THIS is a useful and ingenious novelty. It consists of two rows of bars, one of which fits any ordinary grate, and is furnished with crossed slots. By means of these, the other part can be adjusted to varied positions. Thus, upright, the two form an efficient coal-saver along the whole depth of the grate. By placing the detachable bars horizontally a stand is provided for the heating of irons or for cooking. If the bar of the upper portion be placed in the centre slot, there is at once formed a support for a tin or dish at an angle of about 45°, a very good substitute for a Dutch oven. The inventor, Mr. Slater, has obtained provisional protection, and the article is made by the Thrift Manufacturing Company, Hallam Lane, Sheffield. Its simplicity and utility should ensure its success.

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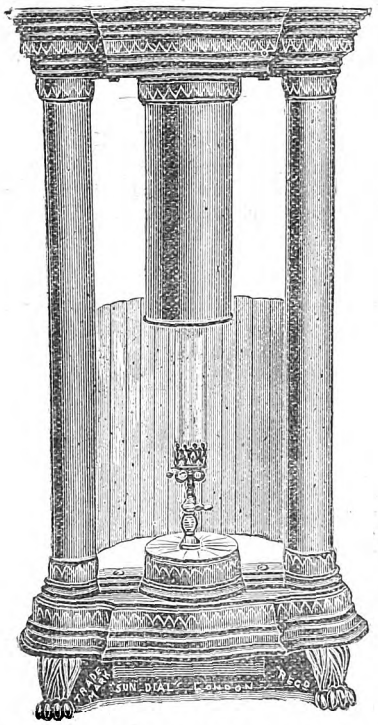
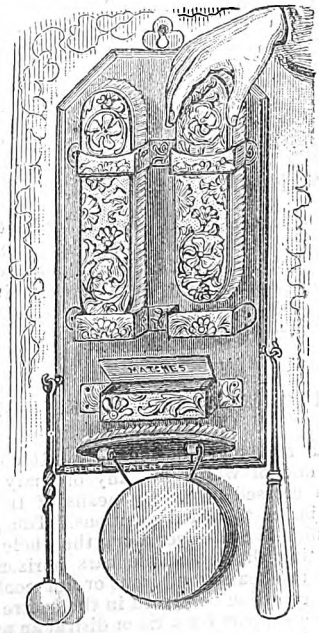
IMPROVED CONDENSING-STOVES.

BILLING & Co, Smart's Buildings, W.C., are introducing an improved heating-stove for gas or oil, which is claimed to be an advance on former efforts. There



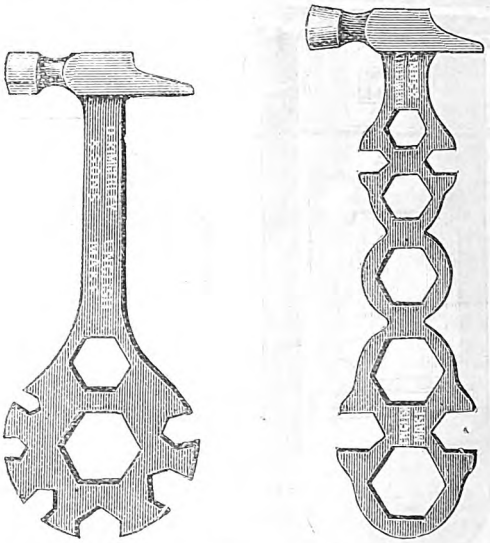
is an inner tube provided which largely increases the heating surface, and permits a constant current of air from the bottom to the top, thereby promoting circulation of warmed air, and materially increasing the efficiency of the apparatus. A copper reflector radiates the heat of



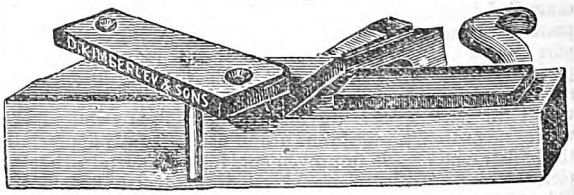
the flame, and it is declared that no flue is required, the products of combustion being condensed into a tray beneath. The style and finish of the apparatus are good, and for offices or apartments where it is not convenient or possible to have a coal fire an efficient substitute is obtainable by using one of these stoves. Billing & Co. have also brought out a patent brush-holder, which further contains a gong, match-box, brim brush, and other accessories, making a very useful as well as ornamental adjunct to the hall or to the cottage. It forms an exceptionally good birthday, wedding, or Christmas present, and being elegant in design it ought to go well.

CYCLE-SPANNERS AND PATENT JACK AND TRYING PLANES.

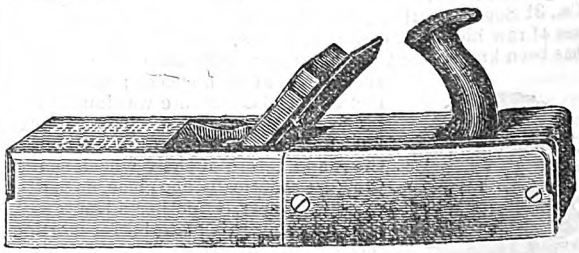
DAVID KIMBERLEY & SONS, Highgate Tool-works, Birmingham, call our attention to two new-pattern bicycle-spanners,



which they believe will prove useful friends to cyclists. These spanners will fit every size nut to be found on any ordinary machine, whilst the head takes the form of a hammer. Another of this firm's novelties is a patent jack and trying plane, with oilstone combined. The great



advantage possessed by these planes is that, no matter where the workman who is using the plane may be, he always has with him his oilstone, so that any of the tools that he may require to sharpen up can be at once sharpened without the trouble of searching for oilstone. A glance at the engraving will at once show the simplicity and yet the great usefulness of this tool. It does not interfere in any way with the



working of the plane, and every one is guaranteed to be of the very best well-seasoned timber, all irons being fitted and ground up ready for use. In planes fitted with G.S. irons Welsh oilstones are inserted, but with planes fitted with C.S. irons Charnley Forest oilstones are put in.

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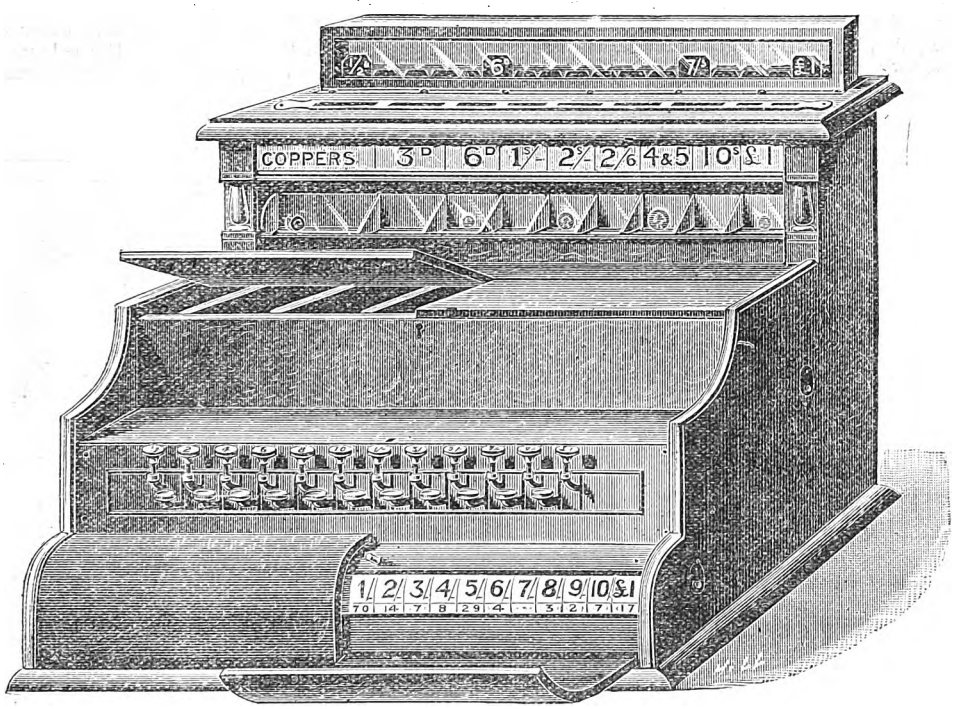
"ROYAL CASHIER" TILL.

Mr. Ward, Strand, W.C., has brought out a till, shown in the illustration, which is a special line of mechanical skill and, being sufficiently light to be readily portable, will no doubt form a cheap and very useful lamp for any class of outside contractors' work or for lighting up large spaces for temporary occasions. The firm also manufacture every



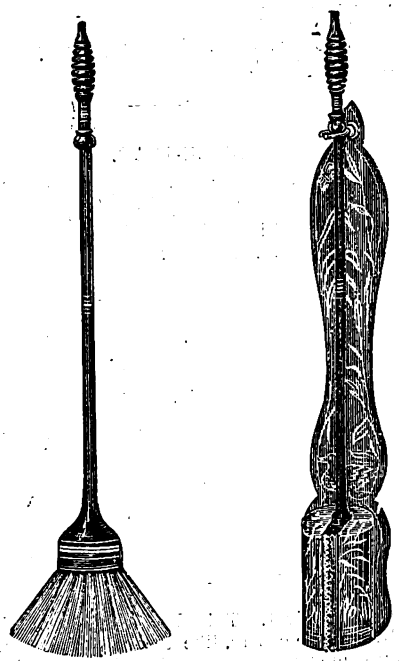
well worth inspection. It is claimed to be an accurate cashier and accountant. All moneys paid in are registered, and it keeps account of sums paid out. There are no pen, paper, or written check required—the machine itself records each movement or transaction, the coins of the last two customers remaining on view before they disappear in the receptacle below. The cylinder registers from a halfpenny to any large sum without any attention except the action of paying it in, and the proprietor can examine his totals each day or at any period he chooses, the machine indicating the item at a glance. As a specimen of mechanism worked out with mathematical precision it is certainly very clever, and, having a practical application, the inventor deserves recognition.

IMPROVED PARAFFIN LAMPS.

R. H. Mellor & Sons, "Owl" Lampworks, Market Place, Oldham, who are amongst the largest manufacturers in the kingdom of paraffin lamps used for open-air stalls and by showmen and travelling exhibitors, have introduced a much larger sized lamp of this class than any that have hitherto been in use. This lamp, which in the first instance has been made specially to the order of the Sequah Company (Limited), for whom between thirty and forty have already been made, in part completion of a much larger order, is constructed to give a light equal to 600-candle power. These lamps burn the ordinary paraffin oil, and this is contained in a galvanised-iron tank holding three gallons, the oil passing down through an iron tube to the burner, which is so arranged that the supply of oil passes first over the plate, which is heated by the flame underneath, thus converting the oil in its passage to the burner into gas, and it is admitted in the form of a fine spray through a small jet, and produces a brilliant expanding flame. The action of the burner comes into operation in a very few seconds after the lamp has been lighted, and the supply of three gallons of the oil in the tank is sufficient to provide a light of 600-candle power for a period of eight hours. Notwithstanding their increased size the lamps are so arranged that they can be readily hung in any position, variety of paraffin lamp for similar purposes from 20-candle up to 100-candle power.

A PATENT HEARTHBRUSH-HOLDER.

W. B. Fordham & Sons (Limited), York Road, King's Cross, N., have taken up the manufacture of a patent brush-holder, in unbreakable pulp-ware, and an improved pattern



has just been completed, which is illustrated herewith. The handiness of the device will commend it to the attention of buyers, and it ought to have a very successful run.

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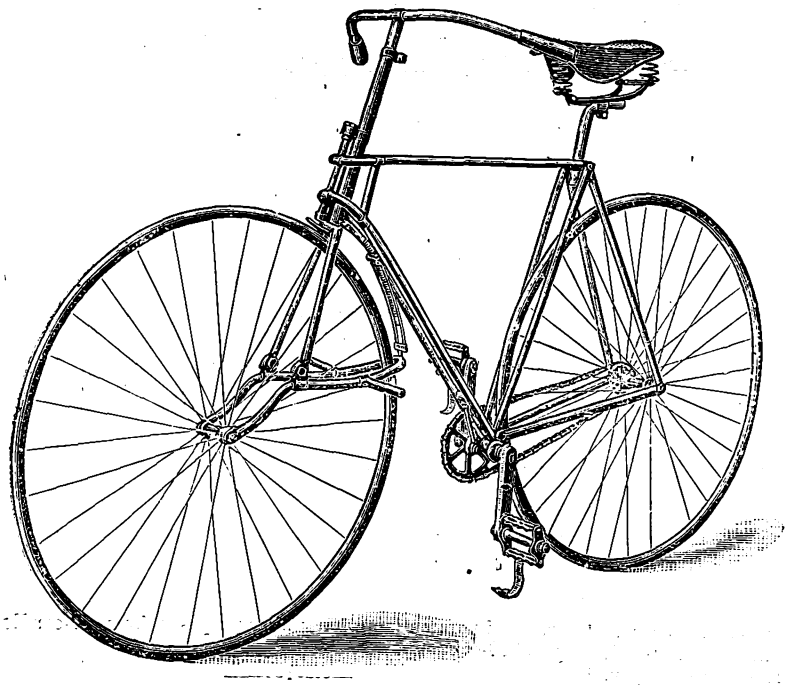
THE "KOH-I-NOOR" BICYCLE.

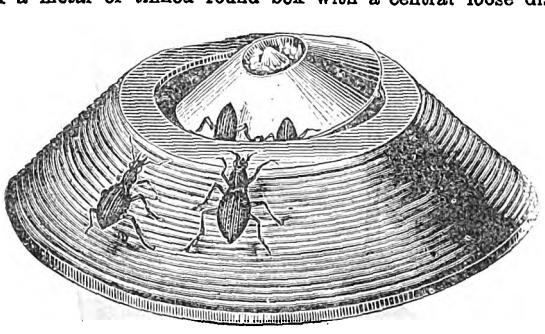
UNDER this name, Samuel Vale & Co., Walsall, have brought out an improved machine, which, besides possessing a true double diamond frame, is fitted with a novel steering arrangement. This is effected owing to the frame not being fixed directly to the pillar, but carried right round it, and fixed by means of a screw-pin in front of the pillar, whereby the



strain on the pillar arising from jolting in travelling over rough roads is obviated. Another special feature is an improved "rocker" foot-brake and foot-rest combined. This is a spiral spring, so fixed on a frame to the fork of the front wheel that pressure of the foot in descending a hill breaks the pace, and simultaneously reduces the vibration to a minimum. The weight of a roadster "Koh-i-noor" complete is about 35 lbs., and it is usually sent out enamelled black, with parts plated.

BEETLE-TRAP.

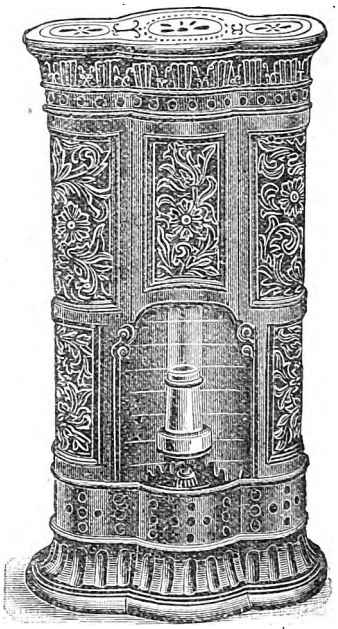
THE accompanying engraving represents a new beetle-trap, provisionally protected by Mr. Richards, and now being manufactured by Lawrie & Bishop, Birmingham. It consists of a metal or tinned round box with a central loose disc



working upon a pivot. This disc is made of light brass, with the bait in the centre, like the bait of an ordinary trap. The slightest movement causes the disc to oscillate, so that as soon as beetles, cockroaches, or other inquisitive crawling insects place their feet upon it they are precipitated into the box below and there safely secured.

COMBINATION GAS-STOVE.

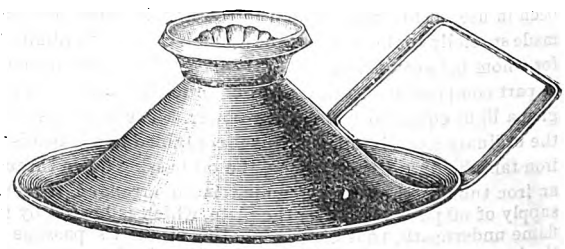
THE London Fire Appliance Company, Buchanan Street, Glasgow, encouraged by the demand for their condensing stoves for heating the apartments of dwelling-houses, have introduced a handsome Doulton ware cover of the special design shown in the illustration. The colours in which the ware is produced may be arranged to harmonise with the



prevailing tints of the room in which the stove is to be placed, thus rendering it an ornamental rather than an unsightly adjunct. For convenience in handling, the cover is made in three portions nicely fitted together, and it is claimed that on becoming thoroughly heated up a much greater degree of warmth is given off than with the plain article. The stove itself is made, as heretofore, to burn gas or oil, or a convertible arrangement may be supplied.

THE PYRAMID CANDLESTICK.

LOMAS & CO, Moor Street, Birmingham, have brought out a candlestick of artistic form, styled the "Pyramid." It is fitted with Lomas's patent china nozzle, which, owing to its graduated and corrugated form, will take any sized candle. The nozzle is held in position by an indiarubber washer



which may be easily removed to allow of thoroughly cleansing both candlestick and nozzle. A further advantage is, that no candle is wasted, as the shape of the stick permits every particle to be consumed. These goods are being made in polished brass, copper, nickel-plated, and japanned in all the art shades, and will be found very convenient for packing for export.

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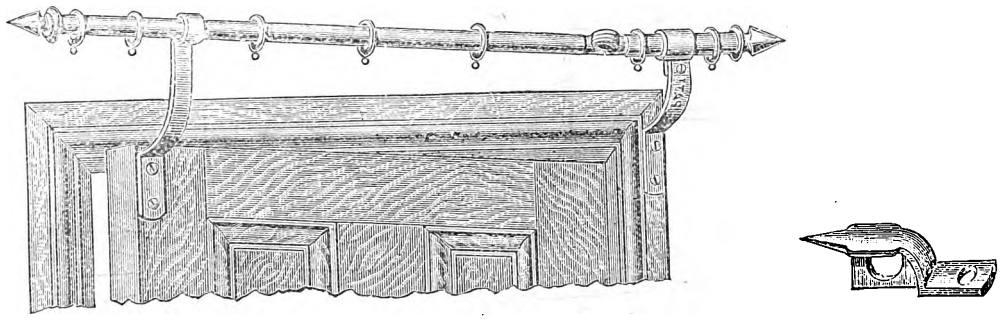
THE "DUVAL-LAWTON" DOOR CURTAIN-ROD.

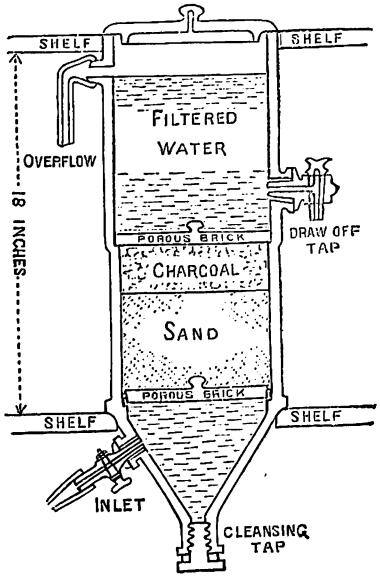
THE latest claimant for popular favour in the shape of curtain-rods is the "Duval-Lawton," now being placed on the market by Mr. G. B. Birch, Cheapside, Birmingham. The style of the article, which is made throughout by machinery,



will be understood by reference to the engraving. A feature of the new rod is its ready adaptability to either right or left hand doors, and also its strength and uniformly good finish—points which cannot fail to recommend this article to buyers' attention. The same firm have also recently placed on the market the Young & Lawton patent stair-rod eye, which, owing to its neat appearance and the improvement effected in the part which receives the hammer blows, will be a formidable competitor with either machine-made or cast stair-rod eyes.

THE "LITTLE FOUNTAIN" FILTER.

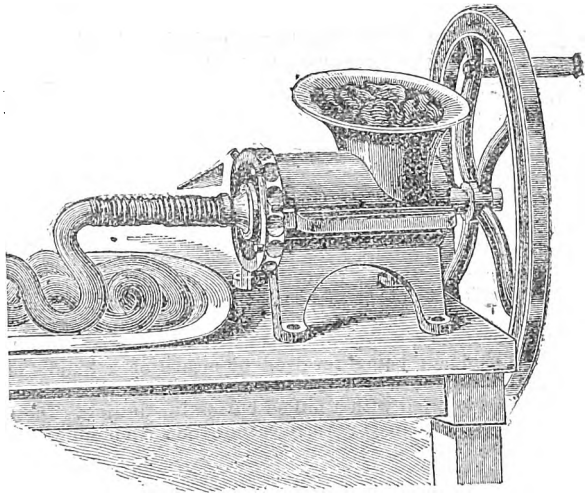
THIS is a domestic filter for pantry use, and is intended to be fixed between two shelves at about 18 inches apart. It is connected to the main water-supply, or to the supply-tank, and gives a constant flow of water. The adoption of such a filter obviates the trouble and inconvenience of filling by hand, and, as the water is kept constantly running, no stagnant



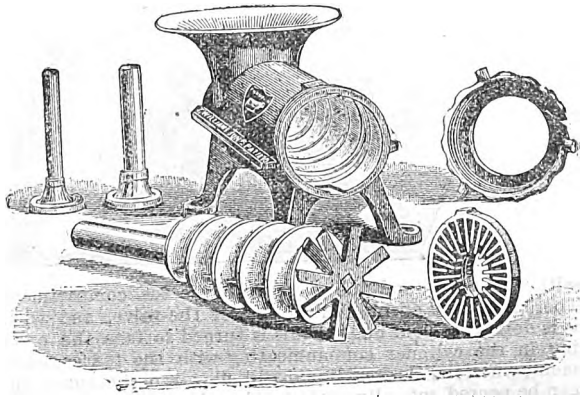
water accumulates or remains in the filter. As the filtering media are ordinary wood charcoal and clean silver sand, it is a simple matter to renew these when required, thus materially lessening the expense of maintenance, and avoiding the risk of contaminating the water, rather than purifying it, as sometimes happens where carbon blocks are used. George Skey & Co., Tamworth, are manufacturing the filter under Mr. Fogerty's patent.

"CHAMPION" MEAT-CHOPPER.

MR. THOMAS WILLIAMS, West Smithfield, E.C., has brought out a patent meat-chopper, which is declared to be an important advance on machinery of this class. The cutting action is by means of a fixed disc of steel, with radial blades, eight arms fastened to the end of the revolving spindle giving a scissors-like cut, which disposes of gristle and sinewy meat in a very effective manner. One of these machines, size No. 4, will cut nearly 5 lbs. of meat per minute with the certainty



that it will be cut and thoroughly mixed, and by the attachment of a nozzle sausages in large quantities can be made at the same time. The simplicity of the mechanism is one of



the important features of the machine, and having few parts the wear is reduced to a minimum. Judging from a sample of its action a few days ago the "Champion" meat-cutter and sausage-filler possesses merits which entitle it to the attention of the trade.

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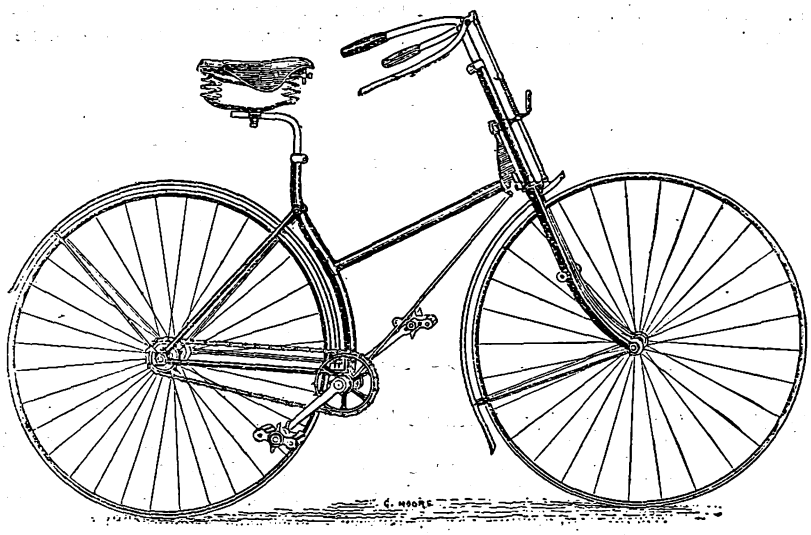
IMPROVED SAFETY BICYCLE.

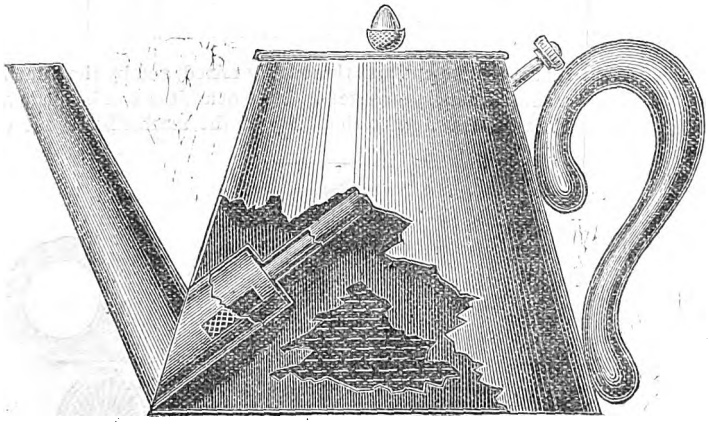
MR. W. COOTE REYNOLDS, Devonshire Street, W.C., is engaged upon a cheap line of safeties, as shown in the annexed engraving, and which is becoming a very popular



pattern. Other improvements are embodied in the "A," "B," "C," and "D" patterns, their mode of construction admitting the use of ball-heads and new air-cushion tires. Already the demand is considerable for this type of safety, and is, in fact, the promising style for next season.

PATENT TEA AND COFFEE POT COMBINED.

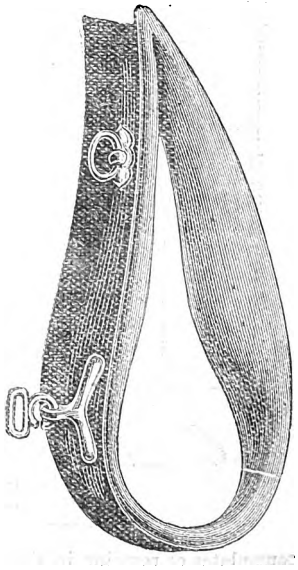
MR. W. SMITH, Ayr Gasworks, has brought out something new in the shape of a pot for holding two different liquids simultaneously. It has a vertical diaphragm or partition, which divides it into two compartments—one for holding, say, tea, and the other for coffee. In this diaphragm is a cylinder or casing, inside which is fitted a hollow cylindrical valve, capable of being revolved by means of a handle or shaft, the end of which protrudes just above the teapot-handle, and is fitted with a milled button for turning. There are two openings in the valve-casing, one communicating



with the coffee and the other with the tea compartment. There is also an opening in the side of the valve, and when it is desired to pour out tea this is turned to face the opening in the cylinder communicating with the tea compartment, when the desired liquid will flow into the spout and can be poured out. By again turning the valve round to the opening of the coffee compartment the tea supply is cut off, and coffee can be poured out, or the valve may be so turned as to cut off both tea and coffee. The arrangement seems to work well, and, as it will certainly be a great convenience in every household, the pot is likely to be in good demand.

THE WENHAM COMPANY'S SPECIALTIES.

THE WENHAM COMPANY, Upper Ogle Street, W., finding that the novelty of their well-known lamp had worn off, looked about for specialties which would work in with it. A large and varied assortment of electric-light fittings have been introduced, artistic metal-work is being taken in hand, and these, in connection with the "Leeds" warming-stoves, enlarge the company's scope of operations in an important degree. Besides the above marks of progress, the company are in close affinity with another concern, styled the "Commercial Manufacturing Company," which occupies part of the premises, and has taken up the production of patent enamelled metal horse-collars. One of the class No. 4 is shown in the accompanying illustration, the fittings of which are attached, so that no harness, in the ordinary sense of the word, is required. The weight of the collar complete, fully equipped, ready for the traces to be fastened to it, is 7½ lbs.; so that in the direction of burden to the animal the new departure will compare favourably with the old custom. In appearance the enamelled metal collar is strikingly similar to



the ordinary patent leather one, but of less weight. It is stuffed in the usual way, but the metal collar readily lends itself to the application of an air-bag combination, which is declared to be more humane to the animals. The metal collars are supplied in any desired colour, and, having been practically tested by some of the leading cab and omnibus

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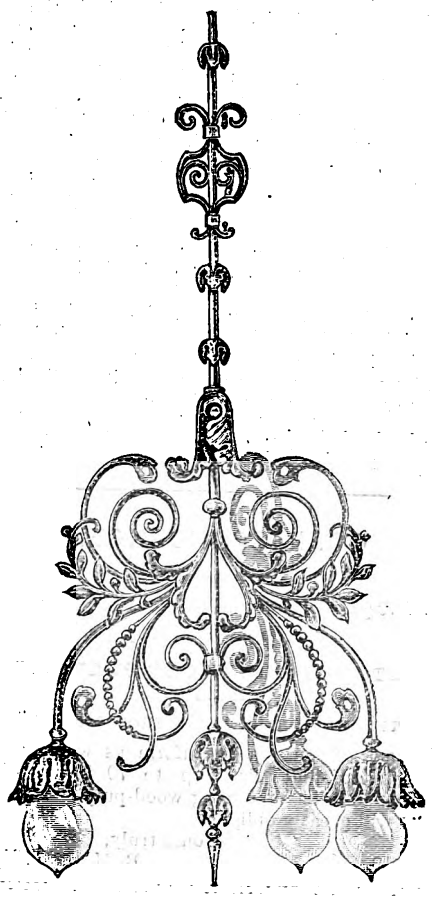
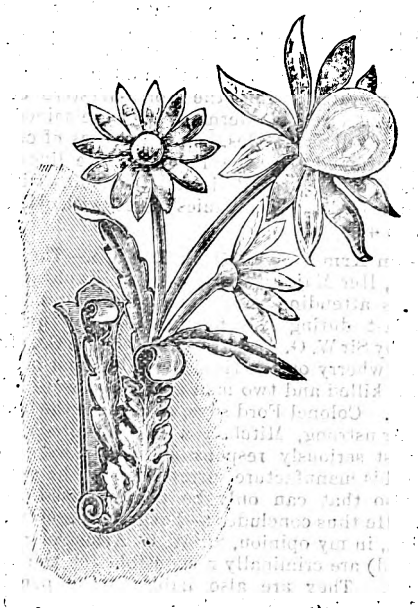
proprietors and found to act exceedingly well, it seems reasonable to suppose that the venture will obtain a good share of patronage. In the electric-light fittings department



several new patterns have been brought out quite recently, two of newest designs, an electrolier and wall-bracket, being illustrated. Besides these, new designs in Wenham lamps



have been brought out, and numerous details adapted to former patterns, making them suitable for outside illumination at theatres, hotels, railway-stations, and other places where a good light is especially necessary.

THE ANNEALING OF COPPER.

COPPER is at present almost universally annealed in muffles, in which it is raised to the desired temperature and subsequently allowed to cool either in the air or in water. It is necessary to watch the copper carefully, so that when it has reached the right temperature it may be drawn from the muffle and allowed to cool. If the copper is heated to too high a temperature, or is left in the muffle at the ordinary temperature of annealing for too long a time, it is "burnt," as the workmen say. Copper that has been "burnt" is yellow, coarsely granular, and exceedingly brittle—so much so that in some samples it cannot be bent once at a right angle without breaking. It is even more brittle at a red heat than when cold. In the case of coarse wire it is found that only the surface is "burnt," while the interior is damaged to a far less extent. This causes the exterior to split loose from the interior when bent or rolled, thus giving the appearance of a brittle copper tube with a copper wire snugly fitted into it. Cracks a half-inch in depth have been observed on the surface of an ingot on its first pass through the rolls, all due to the exterior "burning." It is quite apparent that copper that has been overheated in the muffle is entirely unfit for rolling, either for rods or sheet copper or for wire-drawing. It is found that the purer forms of copper are far less liable to be harmed by overheating than samples containing even a small amount of impurities. Even the ordinary heating in a muffle will suffice to "burn" in this manner the surface of some specimens of copper, and thus render them entirely unfit for further working. Copper that has been thus ruined is of use only to be refined again. As may be inferred from the above, only the highest grades of refined copper are at present used for drawing or rolling. This is not because the lower grades, when refined, cannot stand sufficiently high tests, but because the present methods of working are not adequate to prevent these grades of copper from experiencing the deterioration due to overheating. This is unfortunate for the manufacturer, since, I understand, he has to pay cash in advance for the highest grades of refined copper.

In order better to appreciate the explanation of the various phenomena of copper-annealing, let us see what refined copper is. The process of refining copper consists in an oxidising action followed by a reducing action which, since it is performed by the aid of gases generated by stirring the melted copper with a pole, is called poling. The object of the oxidation is to oxidise and either volatilise or turn to slag all the impurities contained in the copper. This procedure is materially aided by the fact that the suboxide of copper is freely soluble in metallic copper, and thus penetrates to all parts of the copper, and, parting with its oxygen, oxidises the impurities. The object of the reducing part of the refining process is to change the excess of the suboxide of copper to metallic copper. Copper containing even less than 1 per cent. of the suboxide of copper shows decreased malleability and ductility, and is both cold short and red short. If the copper to be refined contains any impurities, such as arsenic or antimony, it is well not to remove too much of the oxygen in the refining process. If this is done, "over-poled" copper is produced. In this condition it is brittle, granular, of a shiny yellow colour, and more red short than cold short. When the refining has been properly done, and neither too much nor too little oxygen is present, the copper is in the condition of "tough pitch," and is in a fit state to be worked. "Copper is said to be tough pitch when it requires frequent bendings to break it, and when, after it is broken, the colour is pale red, the fracture has a silky lustre, and is fibrous like a tuft of silk." On hammering a piece to a thin plate it should show no cracks at the edge. At tough pitch copper offers the highest degree of malleability and ductility of which a given specimen is capable. This is the condition in which refined copper occurs in the market, and if it could be worked without changing this tough pitch, any specimen of copper that could be brought to this condition would be suitable for rolling or drawing. We have seen that tough pitch is changed if we either add oxygen to or take oxygen from refined copper.

By far the more important of these is the removal of oxygen, especially from those specimens that contain more

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than a trace of impurities. This is shown by the absolutely worthless condition of overpoled copper. The addition of carbon also plays a very important part in the production of overpoled copper. That the addition of oxygen to refined copper is not so damaging is shown by the fact that at present nearly all the copper that is worked is considerably oxidised at some stage of the process, and not especially to its detriment. Let us see how the above facts are related to the process of annealing copper. I have already referred to what is known as "burnt" copper. This is nothing more nor less than copper in the overpoled condition. This is brought about by the action of reducing gases in the muffle. By this means the small amount of oxygen necessary to give the copper its tough pitch is removed. This oxygen is combined with impurities in the copper, and thus renders them inert. For example, as explained by Dr. Peters, the oxide of arsenic or antimony is incapable of combining more than mechanically with the copper, but when its oxygen is removed, the arsenic or antimony is left free to combine with the copper. This forms a very brittle alloy, and one that corresponds almost exactly in its properties to overpoled copper. To be sure, overpoled copper is supposed to contain carbon, but that this is not the essentially ruining principle in case of annealing is shown by the fact that pure copper does not undergo this change under conditions that ruin impure copper, and also by the fact that the same state may be produced by annealing in pure hydrogen and thus removing the oxygen that renders the arsenic or antimony inert. No attempt is made to deny the well-known fact that carbon does combine with copper to the extent of 0·2 per cent. and cause it to become exceedingly brittle. It is simply claimed that this is probably not what occurs in the production of so-called burnt copper during annealing. The amount of impurities capable of rendering copper easily "burnt" is exceedingly small. This may be better appreciated when it is considered that from 0·01 to 0·2 per cent. expresses the amount of oxygen necessary to render the impurities inert. The removal of this very small amount of oxygen, which is often so small as to be almost within the limits of the errors of analysis, will suffice to render copper overpoled and ruin it for any use.

It is quite apparent that a really good method of annealing copper will prevent any change in the state of oxidation. To accomplish this it is necessary to prevent access to the heated copper both of atmospheric air, which would oxidise it, and of the reducing gases used in heating the muffle, which would take oxygen away from it. Obviously the only way of accomplishing this is to inclose the copper when heated and till cool in an atmosphere that can neither oxidise nor deoxidise copper. I find that by so doing copper may be heated to the melting-point and allowed to cool again without suffering at all as regards its pitch. There are comparatively few gases that can be used for this purpose, but, fortunately, one which is exceedingly cheap and universally prevalent fulfils all requirements—viz., steam. In order to apply, then, in practice the principles already enunciated, it is necessary only to anneal copper in the ordinary annealing-pots, such as are used for iron, care being taken to enclose the copper while heating and while cooling in an atmosphere of steam. This will effectually exclude air and prevent the ingress of gases used in heating the annealer. Twenty-four hours may be used in the process, as in the annealing of iron-wire, with no detriment to the wire. This may seem incredible to those manufacturers who have tried to anneal copper wire after the manner of annealing iron wire. By this method perfectly bright annealed wire may be produced. Such a process of annealing copper offers many advantages. It allows one to use a grade of copper that has hitherto been worked only at a great disadvantage, owing to the ease with which it gets out of pitch. It allows one to use annealers such as are ordinarily used for annealing iron, and thus cheapens the annealing considerably as compared with the present universal use of muffles. There is no chance of producing the overpoled condition from the action of reducing gases used in heating the muffles. There is no chance of producing underpoled condition due to the absorption of suboxide of copper.

None of the metal is lost as scale, and the saving that is thus effected amounts to a considerable percentage of the total value of the copper. The expense and time of cleaning are wholly saved. Incidentally bright annealed copper is produced by a process which is applicable to copper of any shape, size, or condition, a product that has hitherto been obtained only by processes (mostly secret) which are too cumbersome and too expensive for extensive use, and, as is the case with at least one process with which the author is acquainted, with the danger of producing the over-poled condition, often in only a small section of the wire, but thus ruining the whole piece. If it is desired, the copper may be annealed in an apparatus so arranged that the copper when heated may be dropped into a body of water without access of air, and thus make a far smaller annealing plant suffice. It may be mentioned that copper seems to be made neither softer nor harder by being cooled suddenly in this manner than if cooled slowly, though some of the alloys of copper are rendered somewhat softer by a sudden cooling; in fact, there is not the slightest evidence anywhere to justify the quite prevalent belief that an art of hardening copper was known to the ancients. The hardest tools of the ancients were made of bronze, not copper. By application of the same principles it is possible to prevent both deoxidation and oxidation in the heating of copper ingots for the rolls, and thus, by keeping copper at tough pitch all along, any copper that can be given tough pitch can be used for rolling sheet copper or for wire. I think it also practicable to produce bright copper rods direct from rolls.—C. W. CUMMINS, New York.

CORRESPONDENCE.

[*We are not responsible for the opinions or the statements of our Correspondents.*]

GRINDSTONES FOR WOOD-PULP MILLS.

TO THE EDITOR OF "THE IRONMONGER."

SIR,—Can any of your readers inform us where to obtain grindstones of different sizes up to 70 inches diameter suitable for use in mills producing wood-pulp? Information on this point will greatly oblige,

Yours truly,

September 13. R. M. C. (126/51.)

"Goliath" Rails in Austria.—The question of the adoption of heavy rails for the Austrian lines is being discussed by engineers in that country. At present the Southern Railway is using rails of 35 kilos. per metre. Prior to 1887 a 32-kilo. section was used. The State Railway has adopted since 1882 a rail of 35 kilos. for main lines and 32 kilos. for branches. The Austrian-Hungarian Company since 1869 has employed rails weighing not less than 38 kilos. for all parts of its Austrian system, whilst the North-Western of Austria and the South-North of Germany have remained content with so light a rail as 33 kilos. For purposes of comparison it may be mentioned that the Belgian State lines are now laid with 53-kilo. rails, the Paris and Lyons line with 47, the Northern and Western Companies' lines with 44, and the Gothard with 44-kilo. rails.

Censure on Armstrong, Mitchell & Co.—The report of Colonel Ford, Her Majesty's Inspector of Explosives, on the circumstances attending the explosion which occurred on October 3 last during the manufacture of quick-firing ammunition by Sir W. G. Armstrong, Mitchell & Co. (Limited), Elswick, in a wherry on the river Tyne, has just been issued. One man was killed and two men and a boy were injured by the explosion. Colonel Ford says, as regards the blame, that Sir W. G. Armstrong, Mitchell & Co. (Limited) are in the main and most seriously responsible. They were not only carrying on this manufacture surreptitiously, he says, but in a manner also that can only be characterised as highly dangerous. He thus concludes:—I regret, therefore, to have to report that, in my opinion, Sir W. G. Armstrorg, Mitchell & Co. (Limited) are criminally responsible for the result of this accident. They are also liable to the penalty, not exceeding 100*l.* a day, provided by sections 4 and 39 of the Explosives Act, 1875, for manufacturing explosives at an unauthorised place. I beg to recommend that such proceedings as may be advised be instituted against them.

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PATENTS.

Applications for Letters Patent have been recently made for improvements, &c., in the following articles, the number indicating the order in which the application has been lodged :—

Apparatus for Tilting Casks. 14,016. H. Fradgley

Ball-castors. 13,754. J. Beardmore and J. Cheshire
Bearings. 13,346. A. S. Bowley
Bearings for Swing-mirrors. 13,812. S. Hill
Bicycles. 13,391. H. Shaw
Bicycles. 13,459. W. Hadfield
Bicycles. 13,523. H. Tee
Bicycles. 13,975. W. H. King
Bicycles. 14,031. H. Hall
Bicycle-steps. 13 894. W. Heath, sen.
Brakes. 13,747. J. Conner
Burglar-alarm. 13,449. M. Zagury

Candle-holders. 13,650. C. Bevan, H. Hallam, and C. Lowe
Candlestick. 13,919. G. Hughes, a communication from J. R. Vaile, jun., P. A. Vaile, and E. B. Vaile, of New Zealand
Castors. 13,899. M. Howard
Champagne-taps. 13,772. S. Grafton
Cooking-apparatus. J. Fenton and T. Parr
Corkscrews. 13,3 0. N. S. Heeley
Corkscrews. 13,691. F. Duszynski
Cycle-lamps. 13,826. C. P. Reed and J. H. Watson
Cycle-recorder. 13,761. N. Allan and J. Lakin
Cycles. 13,383. H. F. Hill
Cycle-saddle. 13,868. J. W. Horsfall

Door-latches. 13,957. J. Legge
Door Locks and Latches. 13,590. W. Sturmey
Doors. 14,005 F. Rademann
Dustpan. 13,471. P. Oakes

Egg-beaters. 13,939. A. Trask and C. Tucker
Egg-cooker. 13,551. W. Balch
Egg Cooker and Server. 13,509. H. Igel
Egg-cups. 13,589. T. Gibson

Finger-plate for Doors. 13,643. T. D. Harrier
Firelighters. 13 721. E. V. Goad
Frames for Mattresses. 13,857. C. E. White and G. W. McKnight

Gas-brackets. 13,846. A. Gunn
Gas-burners. 13,664. H. Greenwood

Hasps for Locks. 13,656. J. Titley
Hat-holder. 13,540. A. H. Crosby
Heating-apparatus. 13,332. H. Stevenson
Hollow-ware. 13,330. M. Swain
Hooks. 13,435. J. Raines, jun., and G. Raines
Horseshoes. 14,056. G. Scattergood

Knives. 13,969. J. D. Hannah

Lamp. 13 950. W. H. Higgitt and W. Crowson
Lamp-bracket. 13,560. J. Scourfield
Lamp-globes. 13,758. E. Maxwell
Lamps. 13,448. B. R. Phillipson
Lamps. 13,472. W. Peters
Lanterns. 13,797. T. B. Jeffery
Latches. 13,508. R. Batey
Lathe-chuck. 13,889. F. W. Ames
Lawn-mowers. 13,923. C. H. Braithwaite
Locks. 13,329. A. Cashin
Locks. 13,336. A. Cashin
Locks. 13,369. A. J. Boult, a communication from J. Kriegar, H. Schoen, and A. Dallmer, of Germany
Locks. 13,822. R. C. Wilford
Locks. 13,869. A. Cashin

Machinery for Making Rivets. 13,876. W. Skaife
Marline-pins. 13,378. B. F. Todd
Mashing Potatoes. 13,654. R. Hutchings and J. Mason

Nail-driving Tools. 13,695. W B. Brady
Napkin-holder. 14,067. A. K. Schubert

Pipes and Tubes. 13,991. F. J. Hadfield

Rack-pulleys. 13,580. J. E. Beaver
Ratchet-braces. 13,614. H. Du Bourg Bancroft Espeut
Roller-blind Furniture. 13,659. J. Whitfield

Scissors. 13,918. G. Hughes, a communication from J. R. Vaile, jun., P. A. Vaile, and E. B. Vaile, of New Zealand
Screws. 13,342. J. Andrews
Screws. 13 913. G. Hughes, a communication from J. R. Vaile, jun., P. A. Vaile, and E. Berthold Vaile, of New Zealand
Screw-vices. 13,325. J. Leinen
Scythes. 13,397. W. H. Havenhand
Shears. 13,553. G. Luger
Shovels. 13,600. E. Taylor
Spades. 13,452. P. Caldwell, jun.
Spirit-burners for Heating. 13,623. A. Sweet
Spring Hook and Buckle. 13,967. J. W. Hill
Squares. 13,438. C. L. Bronk
Stench-traps. 13,399. J. M. Wilson
Strainer for Tea and Coffee Pots, &c. 13,930. W. H. Mott

Tablecloth-clip. 13,726. G. Townsend
Taps. 13,737. S. Washington
Teapot. 13,752. W. H. Smith
Tea-strainer. 13,718. S. J. Leach
Toilet-bracket. 13,931. M. Leipnik
Tools and Tool-holders. 13,736. P. M. Justice, a communication from J. S. Birch & Co., United States

Vegetable-slicer. 13,925. C. Maulove
Velocipede-lamps. 13,536. F. Powell and F. Hanmer
Velocipedes. 13,481. R. G. Booth
Velocipedes. 13,847. G. Townsend
Velocipedes. 13,934. H. B. Cloyson
Velocipedes. 14 061. G. Shann
Velocipede-saddles. 13,720. H. H. Chilton
Velocipede-wheels. 13,819. F. J. A. Matthews
Velocipede-wheels. 13,848. P. Tacagni and E. Ephraim Albert
Velocipede-wheels. 13,879. W. Town
Vices. 13,618. G. H. Squier

Wheels. 13,958. G. H. Bird, C. Lee, and A. C. Lee
Window-blind Rack. 13,709. A. Ainley
Window-sash Fasteners. 13,745. G. Willcock
Wire-annealing. 14,063. H. H. Lake, a communication from C. F. Claus, of Germany
Wire Mattresses. 13,598. J. Hoyle

Published Specifications can be obtained at the Patent Office, 38 to 40 Cursitor Street, Chancery Lane, W.C., at the prices mentioned (postage 1d. each extra) :—

1889.

12,616. Stone. Hand-grater for spices, &c. 8d.
12,932. Empson & Hewitt. Cistern-pulls. 8d.
13,418. Defries & Feeny. Plugs for locks, &c. 8d.
13,969. Woods. Coffee-pots, &c. 6d.
14,045. Hartley. Bicycles, &c. 8d.
14,259. Lloyd. Connecting wrought-iron, &c., pipes. 8d.
14,682. Grange. Water-gauges. 8d.
14,835. Pollitt. Bicycles, &c. 6d.
15,728 Haynes. Screens for coal, &c. 8d.
15,960. Whitfield. Metallic bedsteads. 8d.
16,118. Gardner. Sausage-filling machines. 8d.
16,578. Jenks. Cleaning knives and forks. 11d.
16,640. Horrocks. Kitchen range, &c., boilers. 6d.
12 737. Batey. Window-sashes. 8d.
12,740. Bailes & Campbell. Knife-cleaning apparatus. 6d.
13,321. Blake. Supporting velocipedes. 6d.
14,995. Brookes. Velocipedes. 1s. 1d.
15,362. Church. Cooking-stoves. 6d.
15,693. Whitaker. Drawer-knobs, &c. 6d.
15,933. Brindletors. Bicycles, &c. 6d.
16,216. Thompson. Handles for tools, &c. 8d.
16,285. Baugh. Lettered, &c., plates. 6d.
16,299. Smith. Saucepans, &c. 6d.
16,961. Smith. Metallic bedsteads, &c. 8d.
17,503. Hughes. Extracting corks from bottles, &c. 8d.

1890.

10,149. Milliken. Metallic posts. 6d.
10,180. Haddan. Wire-drawing apparatus. 6d.
10,193. Miller and others. Closet-cisterns. 6d.
10,242. Bergmann. Fastening decorative metal plates to walls. 6d.
10,265. Halliday. Travelling-trunks. 6d.
2,457. Williams. Cutting up meat, &c. 8d.
8,911. Dyre. Bicycles, &c. 8d.
10,267. Lawrence. Bicycles. 6d.
10,565. Clark. Chains. 6d.
1,863. Wilson. Making wire rope. 8d.
3,122. Tucker. Cooking fish. 6d.
3,279. Skinner. Heating water, &c. 6d.
8,310. Smith. Teapots, &c. 6d.
8,911. Thompson. Grating vegetables, &c. 8d.
9,606. Huhnermann. Pipe coupling. 6d.
10,319. Dede. Candle grease guard. 6d.

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THE AMERICAN MARKETS.

[*Special Despatches by Anglo-American Cable:—From our own Correspondents.*]

NEW YORK, Sept. 18.

The situation generally is pretty much the same as last week. For finished products rather less activity is being displayed by buyers, and prices show a softening tendency. Billets, blooms, and slabs are neglected here. Firm offers for large lots would probably result in a liberal shading of quotations. From the West sales are reported of 9,000 tons of muck bars at between $30 and $30.50, and 6,350 tons of billets and slabs. Business in steel rails is quiet, and the market since last week has been featureless. Wire rods are improving. To-day's firm asking-price for foreign make is $44.50. The majority of tinplate consumers are awaiting the final action of Congress on the tariff question. Meantime business is fairly good, and supplies are moderate, consisting largely of broken stocks. There is an active spot demand from vegetable-canners for 14 by 20 Bessemer cokes. The imports of tinplates this week are 71,380 boxes. The arrivals also include 465 tons of pig iron, 590 tons of old rails, and 572 tons of steel billets.

IRON AND STEEL.

	Sept. 18	Sept. 11
Scotch pig:—		
Glengarnock, No. 1	$22.50	$22.50
Coltness, No. 1	$24.00	$24.00
Shotts, No. 1	$23.00	$23.00
Spiegel iron, 20 per cent.	$30.00 to $30.50	$30.00 to $30.50
Bessemer pig iron	$18.75	$18.75
Standard American foundry iron, No. 1	$17.25 to $18.00	$17.25 to $18.00
American ordinary forge pig	$15.00 to $15.50	$15.00 to $15.50
American refined bars (on dock), per lb.	1.9c.	1.9c.
American muck bars (Pittsburgh), per ton	$30.00	$30.00
No. 1 wrought scrap iron (ex ship)	$21.50	$21.50
Old rails (T's)	$25.00	$25.00
Steel rails	$30 00	$30.00
Steel wire rods (foreign)	$44 50	$43.50 to $44.00
Steel billets	$32.50 to $33.00	$32.50 to $33.00
Nail slabs	$32.50 to $33.00	$32.50 to $33.00
Steel blooms	$32.50 to $33.00	$32.50 to $33 00
Soft-steel sheets, 27-gauge ...per lb.	4.0c.	4.0c.
Steel tank-plates ... ... „	2.45c.	2.45c.
Iron „ ... ... „	2.3c.	2.3c.

METALS.

	Sept. 18	Sept. 11
Copper, Lake Superior ...per lb.	17.0c.	17.0c.
Tin, Straits ... ... „	22 8c.	22.0c.
Lead, common Western ... „	5.0c.	4.9c.
Spelter, ordinary ... ... „	5.5c.	5.5c.
Antimony (Cookson's) ... „	22 50c.	22.00c.

TINPLATES.

	Sept. 18	Sept. 11
Siemens coke-squares, I.C. basis	$5.20	$5 10
Bessemer coke-squares, I.C. basis	$5 10	$5.00
Bessemer cokes, ordinary sizes	$5 20	$5.20
I.C. charcoals, Allaway grade	$5 45	$5.15
I.C. cokes, Pelan grade, 14 by 20	$5.12½	$5.20
I.C. cokes, J.B. grade, 14 by 20	$5.25	$5.25
Terne-plates, Dean grade, 14 by 20	$4.75	$4.75

PHILADELPHIA, Sept. 18.

The pig-iron market is depressed, owing to the large and continually augmenting output. The demand for muck bar is also rather less marked this week, and sellers have climbed down about 30c. Billets have also given way again, and are now offering at about $32—a drop of 75c. on the week. Nail slabs have declined to a still greater extent, to-day's asking-price being only $31, as against $32.25 on Sept. 11. Steel rails are steady, but very little new business can be heard of. Makers are asking $31 at works still. The demand for iron and steel tank-plates continues to show expansion, and the quotations advised last week are firmly maintained.

PITTSBURGH, Sept. 18.

The course of the market here just now is uneventful. Makers report no change in the position either as regards the volume of business doing or prices current. Pig iron is still selling freely, and the call for finished products is steadily good.

Notice.—Extracts from our American Telegrams may be had on Friday morning, by arrangement, on terms which may be learned on application to the publisher. Applicants should specify which of the three telegrams they require—otherwise the extracts sent will deal with the New York telegram only.

THE M'KINLEY TARIFF BILL.

A Philadelphia telegram dated September 13 states:—The Committee of Ways and Means considered the Tariff Bill. Confident reports come from Washington that the Bill will probably be changed by extending the date for its taking effect to thirty days after its passage, with the permission that goods shall remain bonded till January 1. The Committee expects to report the Bill to the House next week, when a discussion will follow for several days on the Senate's amendments. The Secretary will recommend Congress to extend the time of withdrawal of goods from bond under the new tariff till February 1. The Secretary declines to deposit the Treasury money in banks, as he thinks it not feasible, the banks not holding bonds for security as the law requires. There is naturally a rush on the part of owners of goods in bond to release them before the Tariff Bill comes into operation, whereby half of them, at least, would be subject to increased duty. On September 1 the value of the goods warehoused was $2,959,161, on which $1,650,305 duty was due, and since then the amount has been enormously increased. Washington advices show that the tariff provision for the withdrawal of goods bonded before August under

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the existing duties will be extended to February. President Harrison, with the members of the Tariff Conference Committees, all approve the proposal that goods imported after August 1 should pay the new duties if bonded when the Bill passes. The House, after a brief debate, carried out the Republican caucus programme by sending the Tariff Bill to the Conference Committees, where all disputed amendments will now be arranged. The Committee of Ways and Means reported the Bill to the House, recommending it not to concur in any of the Senate's amendments, with immediate reference to the Conference. The Rules Committee reported the rule for permitting two hours' debate on a quorum being obtained. The rule was adopted by 114 votes to 72. The Conference is expected to return the finished Bill to the Houses this week.

THE IRONMONGER DIARY, 1891.

THIS very valuable work, which is more highly appreciated and more largely circulated each succeeding year, is now in course of preparation. The work must go to press within the next few weeks (although it is not issued to home subscribers until towards the end of the year), owing to the large number of copies to be printed, the time required for binding, and the fact that the Australian, New Zealand, South African, Indian, South American, West Indian, &c., copies must be posted in time to reach those parts of the world before the end of the year.

The literary matter in the 1891 Diary will be of high value and importance for reference purposes. The work is in constant use, not only in Great Britain, but wherever British hardware, &c., goods are sold, bought, or used.

Trade Marks and Brands.

This list will be specially and carefully classified under suitable heads, as before, and will be printed on coloured paper, so as to make it a distinct and separate section of the Diary.

In order to make the list thoroughly comprehensive and useful alike to small firms as well as to the larger houses, special and uniform spaces are made, the charge for which is very low and in all cases the same for each space; but firms possessing several brands or marks may have as many separate spaces as they may think fit to occupy, specifying when giving their instructions the various heads under which the marks are to appear.

This section of the Diary is strictly confined to the insertion of trade marks or brands, with just sufficient letterpress to indicate names and addresses and the articles to which the marks or brands are applied. Ordinary trade advertisements are excluded from this particular section, but are inserted elsewhere in the Diary at our usual tariff.

We have ample proof that this list of marks and brands is found of immense service to buyers at home and abroad, especially in the Colonies, inasmuch as inquiries are constantly being addressed to us asking for the kind of information which this list affords.

Every information respecting the Diary may be obtained on application to the Publisher, 42 Cannon Street, E.C.

IRON AND STEEL INSTITUTE.

MEETING AT NEW YORK.

THE proceedings at and in connection with the meeting of the Iron and Steel Institute at New York will be fully and completely reported in a separate extra issue of THE IRONMONGER on October 18.

In addition to the customary report relating to the papers and discussions (which will be fully illustrated), there will be published splendidly-executed portraits on fine-art paper of 38 of the leading American, British, and German metallurgists of the day. These will include those of the presidents of the American Meeting and Reception Committee, the presidents of the chief American engineering and iron trade societies, the secretaries of the meeting, and the treasurer of the Reception Committee; the President, past presidents, members of council, and the treasurer of the Iron and Steel Institute; and three leading officials of the German *Verein Eisenhüttenleute*.

The contents of the Iron and Steel Institute number, therefore, will render it an exceptionally valuable medium for advertising announcements relating to all classes of iron and steel, forge, mill, foundry, and other plant, materials, lubricants, &c. Particulars as to the tariff may be obtained on application to the publisher, 42 Cannon Street, London, E.C.

THE "GAZETTE."

PARTNERSHIPS DISSOLVED.

Hall & Sanderson, Paddock, Huddersfield, plumbers.

Holmes, H., Dobson, B., & Moore, S., under the style of H. Holmes & Co., Halifax, tool-makers; as far as regards S. Moore.

Lucas, E., S., T. H., & W., under the style of E. Lucas & Son, Dronfield, ironfounders, spindle and flyer manufacturers, spade and shovel manufacturers, and general merchants.

Wathen, W. H. & J., Birmingham, die-sinkers, stampers, piercers, lamp-fitting manufacturers, and brassfounders.

THE BANKRUPTCY ACT, 1883.

RECEIVING ORDER.

Glass, Charles, Cardiff, builder.

ADJUDICATIONS.

Glass, Charles, Cardiff, builder.

Kirner, Raphael (trading as Winterhalder & Co.), Bishopsgate Street Without, City, watchmaker and jeweller.

Moxey, Edwin F., St. Thomas the Apostle, builder and carpenter.

Padgett, James, Idle, Yorkshire, plumber and painter.

Ryland, William H., & Watkins, Henry (late trading as the Birmingham Empire Wire-mills Company), Birmingham.

Wadsworth, John, Cheshunt, watch and clock maker, jeweller, and fire insurance agent.

Young, Nathan B., Birkenhead, late of Carnforth, tinplate-worker and iron-worker.

SCOTCH SEQUESTRATION.

Brown, J., & Co., Park Road, Glasgow, paint and colour merchants, September 23, at 1, Faculty Hall, Glasgow.

ORDERS MADE ON APPLICATIONS FOR DISCHARGE.

Garnar, Arthur & Walter (trading as A. & W. Garner), Frankton Road, Hill Street, Peckham, builders, decorators, and contractors—discharge suspended for three weeks.

Potts, George, Boscombe, builder—discharge suspended for twelve months.

Streather, Edward, Raunds, builder—discharge granted as and from January 1, 1891.

Walker, William, Newcastle on-Tyne, builder—discharge suspended for three months.

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FORTHCOMING EVENTS.

NEXT WEEK.

Iron Trade 'Change Meetings:—London Metal Exchange, daily, 12.30 P.M. to 1 P.M. and 3.30 P.M. to 4 P.M. Middlesborough, Tuesday. Wolverhampton, Wednesday. Birmingham, Thursday. Glasgow, daily, 11 A.M. to 12 NOON, and 2 P.M. to 3 P.M.; no market on Saturday. Manchester, Tuesday and Friday, 1.30 P.M. to 3 P.M. Liverpool, daily, from 2 P.M. to 3 P.M. Newport, Wednesday, from 1 P.M. to 2 P.M. Cardiff, daily. Swansea, Tuesday, 2 P.M. to 3 P.M.

FUTURE EVENT.

American Institute of Mining Engineers.—The fifty-seventh meeting will be held in the City of New York, beginning Monday afternoon, September 29, 1890.

(Also see List of Contracts Open.)

(Secretaries of Societies and others are requested to give the Editor early information as to forthcoming meetings, &c., for notification in this column.)

MONEY MARKET.

LONDON, Thursday Night.

OWING to going to press with this special issue a day earlier than usual, we are unable to give the customary money market intelligence. On Wednesday a few repayments fell due to the Bank of England, and caused a somewhat increased demand for call-money. Three per cent. was paid in the morning, but later on loans were offered at 2½ per cent. The discount rates for three months' Bank-bills was 4 per cent. The Bank itself did a very fair business in discounts at 4 per cent. The general opinion is that no change will be made in the minimum, but in the absence of any movement the discount houses are pretty certain to raise their deposit allowances by ½ per cent.

North Staffordshire Mining Institute.—A meeting was held at Stoke-on-Trent on Monday evening. A paper by Mr. T. Trafford Wynne on "The Probable Extension of the Midland Coalfields" was read. He (Mr. Wynne) noticed the borings for coal made by Sir Edward Watkin at Dover, which, he said, had encouraged him to endeavour to make himself acquainted with the probabilities of the extension of the Midland coalfields towards the south. There were, he believed, large areas not shown as carboniferous on the geological maps under which coal might reasonably be expected to occur. He quoted Professor Hull's report in 1854 and other authorities as to the probable extent and direction of the coalfields, and pointed to circumstances which should act as a warning to carefully watch boring operations lest they should inadvertently be boring in the rocks beyond the coal measures.

New Metallurgical Industry for Italy.—Steps are to be taken for the establishment of a new metallurgical industry in Italy. This is the manufacture of small machine-made nails for boots and other light uses. The industry is to be located at Avigliani, and it is to be instituted by the help of French capital, and under French direction. A firm engaged in the machine nail industry in the Doubs department of France has undertaken to erect works at Avigliani. It will transport the necessary machinery as well as a number of French workmen from its own establishment in France, and by this means the factory will be working in a very short space of time. This measure has been taken, it is understood, in consequence of the considerable decline in the importation of French metallurgical manufactures into Italy. It is interesting as showing that manufacturers other than the English are adopting the plan of meeting hostile tariffs by the transference of their establishments to foreign countries. The glass trade in Italy is almost entirely in the hands of French capitalists.

CONTRACTS OPEN.

September 24.—About 500 yards each of 2-inch, 3-inch, and 4-inch cast-iron gas-mains, turned and bored joints, and coated with Smith's solution; also about 40 yards of 6-inch and 120 yards of 4 inch cast-iron steam piping in 9-foot lengths, with faced flanges, together with the necessary tees and bends, for the Rochdale Gas Committee. Further particulars from the Manager, at the Gasworks.

September 24.—Supply of a stone-breaking machine, 12 inches by 8 inches at the mouth, mounted upon wheels, with turntable, horse-shafts, or drag-bar; also automatic screening apparatus, complete, for the Millom Local Board. Particulars from the Surveyor.

September 25.—Heating apparatus at Salford Workhouse. Particulars of the Master, Eccles New Road.

September 30.—Wrought-iron roof to new retort-house, for Burnley Gas Committee. Particulars, on deposit of 21*s.*, from the Borough Surveyor.

September 30.—Station name-boards, latrine-boards, and mileposts (enamelled iron or steel), for the Nizam's Railways Company. Particulars (10*s.*) at 50 Old Broad Street, E.C.

October 20.—Supply of cast-iron pipes, &c., for distribution system of the New Westminster Waterworks, British Columbia. Specifications at the offices of Mr. J. F. Waldie, 53 Waterloo Street, Glasgow, and Matheson & Grant, 32 Walbrook, London, E.C.

RESULTS OF TENDERS.

Cadoxton (Cardiff).—For supply of a steam road-roller, with every appliance, complete, to be delivered free at Cadoxton Station, for the Barry and Cadoxton Local Board:—Aveling & Porter, Rochester (accepted), 350*l.*; R. Taylor, London (second-hand), 350*l.*; J. H. M'Laren, Leeds, 360*l.*; T. Green & Son, London, 400*l.*

Eastbourne.—For providing and setting a Lancashire boiler at the ejector works, Horsey Field, Eastbourne, for the Drainage Committee:—Manlove, Elliott & Fryer, 509*l.*; Ethes Brothers, 505*l.*; Hughes & Lancaster, 455*l.*; Cohen, 440*l.*; Umpleby, 400*l.*; Adamson, 440*l.*; Woodhouse & Rawson, 350*l.*; Taylor & Son (accepted), 352*l.*

Gosport.—For erection of iron building to form new library:—J. Croad, Gosport, 159*l.* (accepted).

Keighley.—For iron railings at the new cemetery, for the Burial Board:—Clayton, Son & Co., Hunslet, Leeds, 226*l.* (accepted).

Liverpool.—For supplying and fixing wrought-iron unclimbable railing, with gateway, at the City Hospital North, Netherfield Road, for the City Council:—R. T. Smith & Co., Whitchurch, Salop, 42*l.* 10*s.* (accepted).

Millom (Cumberland).—For the delivery at Millom of about 3,500 yards 12-inch diameter, 100 yards 8-inch diameter, 15 tons of curved and other special castings, for the Millom Local Board:—Cochrane & Co., Dudley (accepted), 1,605*l.* 3*s.* 3*d.*; T. Edington & Sons, Glasgow, 2,123*l.* 19*s.* 2*d.*; Cochrane, Grove & Co, 2,084*l.*; R. M'Laren & Co., Glasgow, 2,054*l.* 16*s.*; D. P. Stewart & Sons, Glasgow, 2,054*l.* 7*s.*; J. H. Bean & Co., Leeds, 1,995*l.* 18*s.* 1*d.*; Staveley Coal and Iron Company (Limited), Chesterfield, 1,950*l.* 4*s.*; J. Mills, Market Square, Millom, 1,946*l.* 2*s.* 4*d.*; the Stanton Ironworks Company (Limited), Nottingham, 1,903*l.* 8*s.*; J. & S. Roberts, West Bromwich, 1,840*l.* 15*s.* 6*d.*

Tuam (Ireland).—For supplying of about 330 tons of cast-iron turned and bored and plain socket-pipes for the Guardians:—Shaw & Co., Maryhill Ironworks (accepted), 1,896*l.* 13*s.* 9*d.*; Laidlaw & Son, East Moulton Street, 1,921*l.* 17*s.* 5*d.*; Maclaren & Co., Port Eglinton (informal); T. Eddington & Son, Phœnix Foundry, 2,068*l.* 16*s.* 11*d.*; Sharpe & Cruickshank, 21 Wemys Place, 2,061*l.* 5*s.* 6*d.*; the Stanton Ironworks Company, Stanton, Nottingham, 2,134*l.* 13*s.* 9*d.*; W. Curtis & Sons, Abbey Street, Dublin, 2,143*l.* 3*s.* 11*d.*; Newall & Barker, Warrington, 2,185*l.* 15*s.* Rest of Glasgow.

Tuam (Ireland).—For supplying and erecting one iron-breast water-wheel, two horizontal double-acting pumps, supplying only, free at Tuam, patent street water fountains and hydrants, sluice-valves, air-valves, &c., for the Guardians:—The Glenfield Company, Kilmarnock, N.B. (accepted), 384*l.* 3*s.*; Newall & Barker, Warrington, 387*l.* 3*s.* 11*d.*; the Cardigan Engineering Company, Cardigan, 460*l.* 17*s.*; Sharpe & Cruickshank, 21 Wemys, Place, Glasgow, 511*l.* 9*s.*

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SOLID STEEL TABLE-KNIVES.

THE *Iron Age* gives the following account of the process of making solid steel table-knives as carried on by the American Cutlery Company, Chicago. The material of which solid steel table-knives are made is round bars of steel $\frac{13}{32}$-inch in diameter. This is received from steel manufacturers in long lengths. The first process through which it passes is cutting to length. The bars are taken, without being heated, to a pair of shears operated by steam-power, and are cut in

FIG. 1.

The First Stage of a Solid Steel Table-knife.

pieces $6\frac{3}{4}$ inches in length. Fig. 1 is an illustration of one of these pieces, which may be said to be the first stage of a solid steel table-knife.

This small bar of steel is now of the proper length to forge from it the handle and blade of a table-knife in one piece, as will be seen from what follows. The pieces of steel bar are next heated in a small furnace to a bright red, then

FIG. 2.

After the Bar has Passed between Two Rolls.

thrust between two rolls, which flattens one end of each piece to form the blade. Our bar of steel now looks as shown in fig. 2.

The pieces thus partly shaped are next taken in hand by a drop-forge man, who first heats them to a bright red and then places them singly under a heavy hammer, which strikes a blow of 800 lbs., to shape the handle. The hammer is operated by steam, and its head drops vertically between guides. Dies of the shape of the knife-handle are inserted in the head of the hammer and in the anvil, and when the

FIG. 3.

After having been Formed in Dies.

steel bar is placed on the lower die the blow from the upper one forces the metal into the exact contour of the perfect handle, with bolster, neck, &c., as distinct as if they had been moulded or carved. Fig. 3 shows the knife at this stage.

Another heating process is then gone through with, and the knife is ready for the plating or forging of the blade, which up to this time has been left quite thick. A trip-hammer, also operated by steam, is employed for this purpose, which requires comparatively light but rapid blows. The head of the trip-hammer is attached to a long wooden

FIG. 4.

After the Blade has Passed under Trip-hammer.

beam, which is supported in an inclined position on a cross-piece near its opposite end. A cam-wheel revolving rapidly strikes the end of the beam and causes the hammer to rise and fall, springs or cushions causing it to rebound as quickly. Under this hammer the blade is drawn out as shown in the cut above, fig. 4.

The knives now appear extremely rough in outline, as will be observed. A thin edge or fin of metal extends round the handle, and the blade has been drawn out wider than is required for the finished article. They are therefore taken to a press in which the superfluous metal is sheared off. This press is a powerful machine with a head sliding in vertical guides like the head of a steam-hammer. Dies of the shape of a knife are inserted in the head and in the block below it. A rough knife is placed in position on the

FIG. 5.

After the Superfluous Metal is Sheared Off.

lower die, and one stroke of the machine forces the top die on to the lower one, taking off all the projecting metal, making the knife look as represented in fig. 5.

The press used for this purpose also serves a useful function in the manufacture of other goods. It has been adapted to cutting out blanks for iron-handled forks and other cheap grades of table-ware. The steel sheets from which fork-blanks are cut are 6 feet long and $4\frac{5}{8}$ inches wide. The scrap

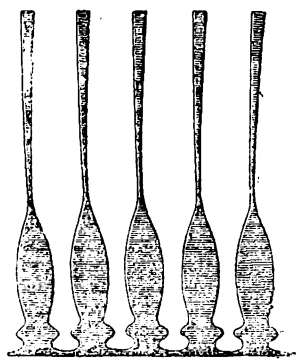

FIG. 6.

Scrap after Cutting Blanks for Iron-handled Forks.

left after this operation presents such a curious appearance that a cut of it is given in fig. 6. This method of cutting such blanks is new to the trade, as they have heretofore been cut from narrow strips of steel, fed into a press with a side cut.

Returning again to the table-knife. It has now assumed its true shape, but it has yet to pass through a number of operations before it is ready for the market. It is very rough, and has, besides, been heated and cooled so frequently

FIG. 7.

After the Handle has been Ground.

that it is quite soft. Hardening and tempering are next in order. The knives are taken to a specially-fitted room, in which they are heated to a proper temperature, plunged in oil to harden them, and afterwards placed in sand to draw their temper. They go hence to the grinding-room, in which are a number of grindstones, each having a heavy block in its rear, with a seat carved out for the grinder. He has a wooden holder in which he places a knife when grinding the

FIG. 8.

After the Blade has been Ground.

blade, in order to keep it straight and flat. These grindstones are very heavy, weighing a ton and a half each, and the workmen employed are necessarily expert grinders, able to turn out their work with the utmost nicety and perfect in every respect. Figs. 7 and 8 show a knife after it has been

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hardened and tempered and the handle ground, and also after the blade has been ground.

The knives next go into the hands of the polishers, who use emery-wheels and other appliances to put the smooth surface on the blades and handles which they must have before silverplating them. An important stage in the process of manufacture is now reached. No piece of fine cutlery goes into the hands of the trade without a name or design of some kind on it. The etching-room therefore receives the knives next. Here the blades have a thin varnish brushed on part of one side, the varnish being made of acid-resisting materials. A boy next places each knife under a hand-press, with a strip of paper between the knife-blade and the design on the face of the press. One stroke of a lever and the varnish is transferred to the paper wherever the outlines of the design touched it. The knives are then taken to another

FIG. 9.

After Polishing and Etching the Name on the Blade.

workman, who drops nitric acid on the spot where the varnish has been removed. It eats the design into the steel in a very short time. Fig. 9 shows a knife after it has been polished and etched.

After the blades have been divested of the remaining varnish the knives are taken to the silverplating-room. Here a small dynamo is used to generate the electrical power required. The knives are dipped in an alkaline bath to remove all grease, and then into an acid bath to remove all scale or other foreign substances from their surface. They are next placed in small wire racks, each of which has a dozen rings in a circular framework around the bottom of it. The knives are run through these rings and stand upright, resting on their bolsters. The racks are hung on a wire running over the silverplating-tank, which is filled with a plating solution deep enough to cover the whole of the knives. Plates of solid silver are suspended on another wire in the same tank, and the action of the electrical current gradually decomposes the surface of the precious metal and deposits it in uniform thickness on the surface of the knives, the thickness of the deposit depending on the length of time the knives remain in the tank. So well is the metal coating distributed that even the points of contact, where the knives rest on the rack, are as thickly plated as any other part. The knives are now of a dead-white colour, without a particle of gloss. This they receive at the hands of the burnisher, who has no machinery to aid him. Seated at a work-bench, with a padded rest for the end of the knife before him, he takes a wooden-handle tool, with a steel blade shaped like a crescent, but having its edges so perfectly rounded, even to the point, that it cannot scratch or mar his work, he proceeds with vigour to rub the knife, occasionally stopping to draw the blade of his tool over an emery-faced walrus-skin wiper or to drop some water on the knife. The dead-silver surface quickly begins to shine, and the expert operator can in a few seconds see his own image reflected from any part of the

FIG. 10.

A Knife Partly Burnished.

knife. Fig. 10 shows a knife partly burnished, being left purposely unfinished to show the action of the tool.

From the burnishing-room the knives go to the packing-room, where bright-faced neatly-dressed girls pack them for shipment after they have been carefully inspected. Some are wrapped in tissue paper, others are put in velvet-lined cases for presentation, and others are packed in a new form just adopted by this company. Six knives and six forks are packed in a handsome cherry box, with racks arranged to hold them in place. The box is intended to meet the wishes of housekeepers, who can thus keep their knives and forks separated when not in use, and will be able to preserve them longer in good condition.

ELECTRIC WELDING.

IN the few years of its rapid development, electric welding and metal working has taken a prominent place in the industrial world. The very ingenious apparatus which is now in considerable use has succeeded admirably in accomplishing many difficult feats in welding and forming various materials. As is now known to every one, the process as generally used simply depends on the heating of the abutting ends of the metal to be welded. By the passage of a current of electricity across the surface of contact it is done with admirable success and rapidity, but the volume of current required is necessarily very large. The heating is obtained in virtue of quantity of current, and to raise any considerable mass of material to a welding temperature requires an enormous expenditure of electrical energy, lasting, to be sure, only a short time, but, nevertheless, requiring special conditions for its production and utilisation. The modern electric-welding plant has up to the present required special forms of apparatus, which,

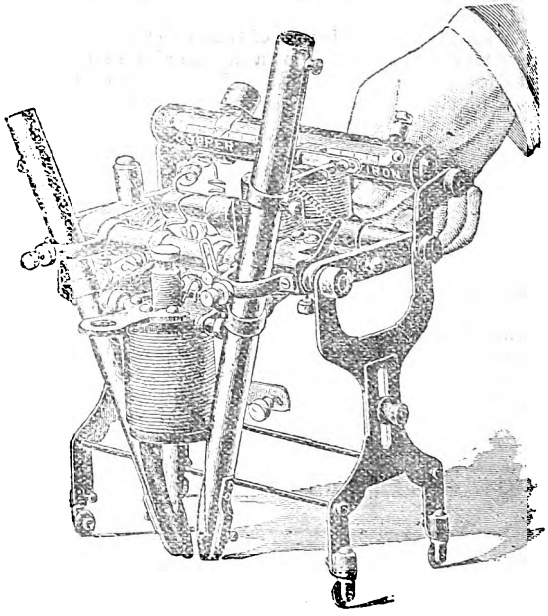

FIG. 1.

Portable Arc Welder.

however efficient, somewhat limit the applicability of the general processes of the electrical heating of metals to workshops large enough or placed favourably enough to secure the necessary current.

We show herewith, says the *Electrical World*, from which we quote, some very ingenious modifications of the general idea of electric welding, having for their purpose the reduction of the maximum amount of current required, and, what is no less important, utilising the heat of electric energy in such a way that welding can be done with ordinary currents from common and readily available machines, so that wherever an arc or incandescent circuit is available welding can be successfully carried on. The various devices are the invention of C. L. Coffin, Detroit, Mich., and the fundamental principle on which he has worked may, perhaps, be called that of an electrical blowpipe. The general principle employed is the heating of the points of contact, or, rather, heating of the surfaces to be welded, by the application of the electric arc formed between two converging carbon pencils, and blown downward like a blowpipe flame by the influence of an electro magnet. Fig. 1 shows the simple portable arc welder intended for small work, such as may be found in tin-shops, plumbers'-shops, and in light metal work generally. The frame is supported upon insulating rollers, and carries the regulating apparatus. The magnetic blast can be regulated in two ways—by raising or lowering the

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threaded core, or by a switch. A scale is provided so that a tool may be set for working upon metal of different thicknesses, and this is so calculated that when the index-hand is set to a figure denoting the gauge of the material operated upon the best result will be obtained.

The great beauty of this arc welding is that it places at the disposal of the operator an enormous temperature, which can be applied to just the point desired, and all this is available wherever an electric circuit can be obtained. It may be placed on any continuous current circuit, or operated from any dynamo intended for arc or incandescent lighting. Where it is impossible to secure service through a central station a small isolated dynamo may be used. It is almost literally an electrical blowpipe of enormous power and ready applicability to all sorts of conditions. The expense of installation is comparatively light, on account of the simplicity of the apparatus, and because no special dynamos have to be installed. The cost of maintenance is something like that of an ordinary arc lamp, of which the ordinary welder is about the equivalent in energy consumed. As it is sometimes necessary to reinforce a weld, this contingency has been provided for by other appliances, whereby the reinforcing material can be supplied in semi-molten condition at the point

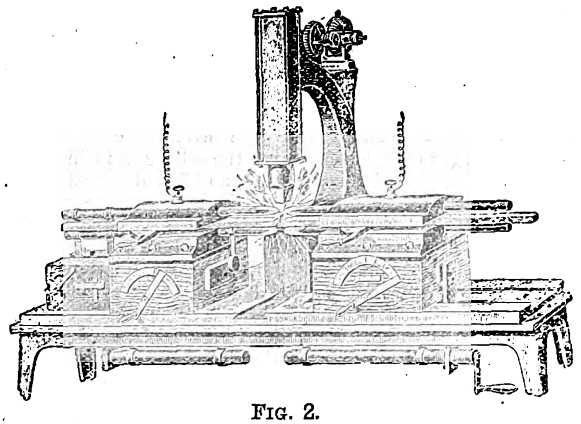

FIG. 2.
Automatic Arc Welder.

desired. For special purposes an air-blast is sometimes used in connection with a magnetic blast. Of course it should be said that the welding of steel by this process requires some special precautions by reason of the intense heat at hand; but the work can be successfully done, and other metals are as manageable by this as by any process.

The apparatus shown in fig. 2 is a modified form of welder whereby the material may be heated in three ways—by incandescence as in the common process, the arc, or by both, the material being secured in the clamps as in the illustration. The workman turns on the current. The arc is then formed between two pairs of carbons upon each side of the material. It will be seen that the extremity of the metal in this instance is subject to the intense heat of the arc. When the temperature is sufficient for welding, the small switch seen at the left is moved over one point, which throws the carbon and carbon-regulating apparatus, shown on the left, out of circuit and energises the electro-magnets contained in the base of the clamp-blocks. At the same time, the releasing mechanism causes the pairs of carbons to recede, and the magnets being attracted towards each other draw the material together at a steady uniform pressure, which can be regulated to any temperature or degree. The electro-magnet carried on the travelling-block to the right is wound in sections or separate bobbins, the terminals of which are connected with the switch-points, so that the work can be effected in almost any desired way by the influence of the magnet above it. When sufficient pressure has been applied by moving the small switch one point more, the little motor operating the electric hammer can be put in operation. The anvil-block under the material first moves forward, and then the electric hammer is automatically thrown into operation. This may be arranged in various ways. In the machine illustrated the drop is suspended in a solenoid of many spools, and terminals are brought up in a double commutator so arranged that ordinating impulses are given when the contacts are revolved over the face of the commutator. They are so arranged that the force of the blow can be regulated. The speed of the motor can be governed by the switch rheostat shown at the left, and carried on to the base of the clamp-blocks. When the weld has been sufficiently hammered the hammer is thrown out of circuit and the anvil thrown back from under the work, cutting out the motor when it reaches its place.

This machine is also arranged so that the carbon may be dispensed with and the arc sprung between the extremities of the material if desired. In this arrangement the magnets are in shunt around the arc so arranged by resistances that when the resistance of the arc and the material, by reason of its being highly heated, has reached a certain predetermined point, the current is shut off. The arc regulating the apparatus and the magnets automatically press the weld home, the hammer is thrown into action, and the weld applied as before. For very thin material this machine is

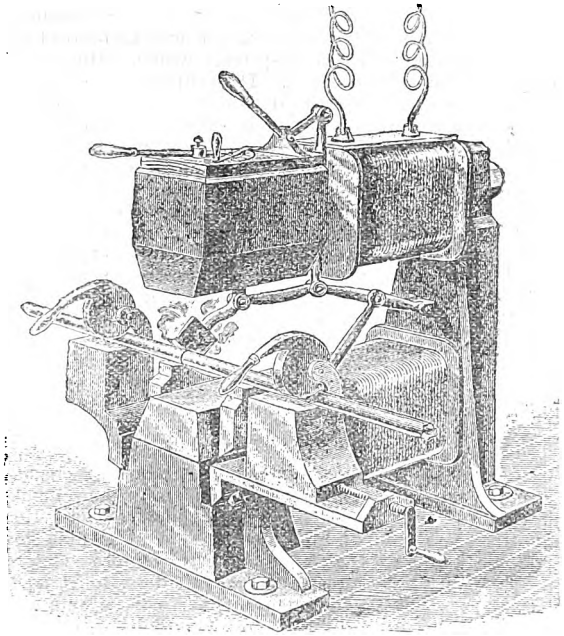

FIG. 3.
Improved Incandescent Welder.

provided with a cut-out to the arc-regulating device, so that the material is heated by the current itself and by the carbons, which are brought together, and between which the material rests. The whole machine is of a most novel character, and is reported to work with beautiful regularity. It is so constructed that the same pressure and amount of hammering can be applied to many thousand welds without variation, thus making it nearly automatic in its operation.

Fig. 3 shows a modification of the incandescent welding process for the purpose of localising the heat and producing an unusually great electrical resistance at the joint so as to facilitate the initial part of the operation, which often demands a very large amount of current. A resisting body, such as a thin sheet of mica, is temporarily placed between part of the surfaces to be welded and withdrawn when the welding action has been fairly started. In addition, a powerful magnetic field is concentrated around the joint for the purpose of aiding in the same action. It is claimed that the initial demand for current on incandescent welding is considerably reduced by this process, but it is to be regarded as a modification of ordinary incandescent welding rather than a distinctly new operation like the arc welding. It seems altogether probable that the arc-welding machine may find a very considerable use, especially as it may be made very small, so that it can be handled with the greatest facility. By no other means known can so enormous a temperature be regulated and adjusted with such facility. Mr. Coffin even proposes to make a very minute arc welder for jewellers' use and the smallest metal-work—a little tool that can be handled almost as readily as a pencil. While, of course, unable to cope with large work, it would be exceedingly handy in small operations of metal-working.

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The whole arc process is, for obvious reasons, a most convenient one, and is as neat theoretically as it is said to be successful in practice. The idea of handling the electric arc as one would a blowpipe, with a magnetic blast instead of air, is certainly a very beautiful and ingenious application of theory, and, while the full details of the work done have not been made public, the apparatus has been sufficiently tested to show that it possesses very many useful qualities.

MARKING PRICES.

(FROM AN OCCASIONAL CORRESPONDENT.)

THERE is so great a diversity of opinion, and so many local variations of practice in the hardware trade as to the method of marking prices that it may be useful to ironmongers to summarise the systems which, with modifications, are generally adopted. The subject covers so wide a field that it would be absurd to write authoritatively, as if rules for universal application could be drawn up on hard-and-fast lines. This paper is, therefore, chiefly suggestive. Its purpose will be achieved if it leads readers to make any improvement in by no means unimportant details. Any one who has a substantially different plan, or changes in the working of those given, which may be of equal advantage to others, will oblige by communicating his ideas to the Editor for the correspondence column. I propose to consider the subject from the middleman's standpoint of the three classes:—(*A*) Strictly wholesale dealers; (*B*) Mixed wholesale and retail traders; (*C*) Retail shopkeepers.

(*A*) *The Wholesale Dealer.*

No plain-figure prices should be exposed in a wholesale store under any system. It is unfair to the retailer because it gives casual callers and the private bargain-hunters, who have a knack of "accidentally" intruding, a chance of learning the trade price. It is imprudent in the sellers' own interest, as giving the chance of too much information to his trade rivals and to his manufacturers. The first step in pricing, therefore, is to construct a private figure-code. Some people do this by an arrangement of dots, lines, squares, circles, &c., but the ordinary alphabetical formula is preferable, and a real or fancy word is better than an arbitrary jumble of letters. Such as the following, for instance, is easily learned and permanently remembered—

1 2 3 4 5 6 7 8 9 0
r e g u l a t i o n

Having got our code, we may then make choice of a system. The three which commend themselves to me as most suitable, *per se*, and yet flexible for changes in detail to suit circumstances, are hereafter sketched under Nos. 1, 2, and 3.

1. *The Card-and-book Method.*—Except the standard or list numbers, which in some goods indicate size, do not allow the manufacturer to put any figures on the parcel. If the descriptive label be not enough distinction, let the maker affix securely (but easily removable when desired) a numbered ticket to correspond with his invoice. Get a strongly-bound book, and letter it "Descriptions." This will not be needed for goods sufficiently described by their trade name, such as wood-screws, plane-irons, firmer chisels, &c., though even for them a number may be at times a useful key to quality or maker. It will, however, be found of great utility for cutlery and other goods of many patterns and designs, as door and coffin furniture, plate, &c. This should be ruled in columns for a stock or pattern number, maker's name and address, maker's number, cost price, and description. The latter may be merely general, as "one-blade pocket-knives," when always obtained from one maker who has his own number, but when for goods bought in the open market it is advisable to add full details or sketch. For this purpose it is well to keep the right-hand page of the book blank.

Of course everybody should keep a stock-book on some plan. As part of this system it should include an entry of all the goods brought into the store, under stock number or recognised trade description, with space for periodically marking-off from the sales-books. This may be done in the rough-and-ready fashion of crossing off, thus—Doz. 20 14—indicating that six dozen have been sold, or a column for "inwards," thus—Doz. 20 . 12 . 20—and one for "outwards"—Doz. 6 . 14 . 8 . 4. The first shows at a glance the last daily or weekly balance, and the latter necessitates a little mental effort, but indicates more fully the disposal of the goods. The stock-book should also contain the maker's name and cost price, in code, with some memoranda of his cash discount or net credit, and whether goods are "D" (delivered), or "P" (carriage paid by buyer). In both description and stock books, for all but a small business, subdivisions in sections is convenient, and an agreed range of numbers for each. Thus: Cutlery, fo. 1, No. 1,000 forward; Plate, fo. 50, 3,000, &c.; Door-furniture, fo. 100, 5,000, &c.; and so on.

The object of the full details in stock and description books is that the selling-price book may afford no unnecessary insight to outsiders casting a hasty glance on its pages. No maker's name is requisite, nor alterations for temporary bargains, nor do cash discounts need recording. In pricing, of course the principal or his deputy bears all the etceteras in mind, such as cash terms, free delivery, and so on, just as he will his own average margin, agents' commissions, expenses, &c., and he will decide when he must cut fine, or treat allowances from the net, as a counterpoise to the special concesssions he may have to make to exceptional customers. The price-book should show the average contemporary market cost (in code letters), and the selling in plain figures or code. I prefer the code, using a different coloured ink. A good salesman generally bears in mind his margin for alteration; if not, a reference to the stock account supplies the necessary data. Every parcel should be inscribed with the book-number, when such is given, or trade description corresponding with stock-entry. A large ticket containing the generic name of the goods and their number should be so attached to each pigeon-hole or lot of parcels on the shelves as to be readable from the floor.

Conveniently arranged on strong cards, or, for large articles, placed loose in appropriate drawers, securely ticketed, a numbered muster set is an important adjunct to this system. These samples may be extra and permanent for cheap goods, or machined articles, as nails, wood-screws, &c.; but for wholly and partly hand-made work, or stock obtained from different makers susceptible of variation, it is better to take them from a parcel on the shelf, marking it thus X, and replacing when that lot is cleared. The selling prices may be clearly written out in ordinary figures on ledger paper or card-board tablets, one for each show-card or drawer, so that the inspecting buyer may refer for himself.

The advantages of this No. 1 plan are neatness; orderly records of transactions, frequently useful for after-reference; less writing on parcels; greater facilities for varying quotations, so as to please customers, and yet avoid loss on assorted orders; better opportunity for restricting information to confidential assistants and concealing prices from trade rivals; additional check on errors and irregularities. The chief drawbacks are the occasional inconvenience of two salesmen simultaneously requiring the price-book (though there is no objection to duplicating); a little more time in quoting to inquirers; a somewhat irritating appearance of formality to a man wanting, perhaps, only one or two small parcels; more office or pen work.

When the idea is intelligently adopted the disadvantages are more apparent than real. The quickest and most accurate salesman and storekeeper I ever knew worked on this system, and has for many years continued it unchanged across the Atlantic. Even in complicated and heavy business, the yearly stocktaking, though always effective, was practically formal, his stock-book being virtually as accurate as a cash account. It is possible that in very large and sparsely-manned stores an extra hand might be required, but in other ways the outlay would be recouped Experience of a mixed factors' business, from 500*l.* to 1,000*l.* weekly, has shown that No. 1 may be thoroughly worked without undue pressure by the staff absolutely indispensable under the most happy-go-lucky system imaginable.

2. *The Rough-and-ready System.*—For a day-by-day trade many firms think price and description books (and

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some even a current stock account) superfluous. They take care to have fresh supplies coming forward of all goods selling freely and regularly. "Special bargains" they look upon as distinct transactions, closed when the goods are sold out. Small lots are not worth replacing for the few customers likely to want them, as something may generally be found on hand to replace them. Therefore, in their eyes, it is better to write on each parcel both cost and selling, tie a muster outside, and the thing is done. For a strictly local trade, with fair profits and passably honest assistants, this simple plan may suffice. The cost, of course, will be written in the code letters, and it is better the selling should be so likewise. On the back of the large numbered or descriptive ticket affixed to each lot the initials of maker and date of invoice may be written for reference. It cannot be denied there is a prepossessing simplicity in this style. Every qualified salesman of the stores may be busy at once. If the selling price be marked in plain figures regular customers can walk round and almost wait upon themselves, and buyers wanting only one article may point to it on the shelf and get served more expeditiously than under the No. 1 system. On the other hand, more unwrapping, disfigurement, and general untidiness generally attend this off-handedness. Any sharp porter or junior may learn as much of the business as his employer, and the private code become so common a property as scarcely to remain a safeguard of any value. When the selling is figured plainly, an unscrupulous competitor may send an emissary to learn prices and systematically "cut-rate" conspicuous "leads" in each line; nor is there an easy chance of "loading" other goods to recoup the unprofitable concession customers often obstinately demand on one or two things. In short, notwithstanding its apparent smart simplicity, I only look on No. 2 as principally worth consideration when the trade is mainly with pedlars, hawkers, and small country shopkeepers buying from hand to mouth, and local ironmongers running in for oddments as an occasional convenience.

3. *Changes and Combinations.*—It need hardly be mentioned that Nos. 1 and 2 are susceptible of considerable modifications—*e.g.*, I know one large store where the business theory is so far in accordance with the rough-and-ready plan that there are no separate musters or description-book. Temporary numbers, when convenient, and stock and price books, as in the No. 1 system, are, however, used, and no prices quoted on parcels. In another store both systems are combined—*i.e.*, all the booking and carding of No. 1, with the pricing and sampling of parcels as in No. 2. Here, however, there are plenty of hands, as the employers pride themselves on being able to meet any influx of customers, and delight in Quaker-like order and regularity, in statistics and complex book-keeping, and in taking care that, if there is no nigger-driving in their establishment, neither are there too many idle moments. This double shift seems rather disciplinary than practically useful, though theoretically it should be about perfect. More depends on man than on plan, and no system is infallible against human perversity. I have known education, ten years' practical business training, parcel-marking, and price-book combined all prove broken reeds as checks against inborn carelessness and routine. By a confusion of two lines in an invoice the prices were transposed between common goods at 5*s.* and fine goods at 48*s.* per dozen. On muster-card and parcel alike for days fivepenny articles at 4*s.* each, and 4*s.* beauties at 5*d.* stared Mr. Manager in the face, and it was fortunate the principal, when looking round, detected and rectified the error before greater harm had arisen, as, of couse, some one had carried off a few of the "bargains"—*i.e.*, 24*s.* worth for 2*s* 6*d.*

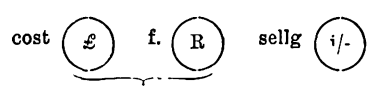
Tickets are dealt with fully in reference to the retail trade. Here it is only necessary to remark that, when they can be made secure, they are always preferable for stock memoranda to writing on either wrappers or labels.

(*B*) *Wholesale and Retail.*

4. In provincial towns, and even in some districts of the metropolis, it is found possible to combine the *rôles* of wholesale and retail ironmongers, and in the country it is usual to serve both classes of customers from one stock. Some few keep books as elaborately as under the No. 1 system; others find No. 2 fits better their time and needs. In either case the only price conspicuous to the public should be the retail selling. If the wholesale business be of moment, care must be taken to allow margin for the retailers to supply the public at the marked prices for a reasonably ample profit.

5. Where wholesale trade is occasional or incidental only it is more easily worked, and with sufficient accuracy, by treating the business as essentially retail, and discounting to shopkeeper from the ordinary marked selling price. This gives a discretionary range, often useful, for it is not uncommon to find customers, say, six miles north of the stores, content with 20 per cent., when those as far south require 25 or 30 discount.

6. In the United States it is not usual in a mixed business to write up retail prices; and, indeed, the practice of displaying prices publicly in wholesale business is more vigorously denounced than by me, mainly for the same reasons. The top wholesale rate is marked on the parcel in private letters, and a hard retail rate calculated by adding from 50c. to 100c. to the dollar. As to the purely wholesale trade in the United States, some combination system, as mentioned in No. 3, is the general rule, though Nos. 1 and 2 have each their admirers. The only special distinction is that, in order to prevent multiplication of quotations, importers, merchants, and manufacturers frequently quote only "f.o.b. rails or boat" in their own city. Consequently the freight is so serious an item for country stores in far distant States that it is usual to calculate and note it, *e.g.*:—



Generally it is sufficient in this country to cover carriage by reckoning it in gross profits, and only rarely is the American plan necessary.

(*C*) *Retail.*

As regards bookkeeping, it can scarcely be expected the shopkeeper will find the same additions necessary to the ordinary set of account-books as sketched in the No. 1 system. No. 2, with as complete a stock-book as convenient, will be more suitable. One of the most striking points of difference, however, between the retail ironmonger and his wholesale brethren lies in the far greater importance of labels, placards, show-cards, and price-tickets have for him than for them. The first three may be reserved for some future occasion, and I pass on at once to the question of prices and tickets. I am told that in some county towns and West-end districts anything beyond minute figures, as reminders to the retailer, is undesirable, partly because a considerable variation of price is indispensable to meet indefinitely prolonged credits, and partly because the few cash customers of these establishments would equally resent plainly-ticketed prices, as vulgarising and casting suspicion on the A1 quality of the goods. I must pass by these exceptions. When I note the long string of aristocratic and plutocratic carriages every day of the season outside the ticket-cash drapers of Knightsbridge, Bayswater, Oxford and Regent Streets, Piccadilly, and of shops of other kinds on the same system in sacred Bond Street itself, it is impossible to see how even in fashionable localities the average ironmonger should suffer by adopting the like business principle. He certainly would not in suburban and less modish neighbourhoods, for there his most formidable rivals in every-day domestic hardware are the oil-shops and cheap bazaars, which give no credit and revel in the boldest and baldest of price-figures. It may, therefore, be taken for granted that, as regards at least four-fifths of the ironmongers, analogy points to the desirability of plainly-ticketed net-cash prices. Each must decide for himself as to the wisdom of declining all but ready-money business, or of cautiously giving a limited credit when the aggregate family acount is good enough to make worth forthgoing the usual quick turnover of his general trade. Thus the question may be narrowed as to what is the best style of retail tickets. Firstly, it is seldom necessary to copy the $11\frac{3}{4}d.$ law of the drapers. When a buyer wants 20 yards of stuff the farthing means 5*d.* If he is purchasing a kettle or other single article it means just itself, for which only the very poorest would cross a street. The first rule for a good ironmonger's ticket is, as far as possible, to avoid fractions. Secondly, there should be no traps, such as are common on, say, a 39*s.* 11*d.* dress, where we may read the 1*l.* from over the way, but can barely discern the 19*s.* 11*d.* when the smart

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young man is descanting on the wonderful bargain under the searching electric light of the counter. Thirdly, uniformity is as desirable as monotony is objectionable.

Whilst all tickets must be plain and agreeable to the eye, it is a good plan to keep them uniform on one line only—*e.g.*, in electroplate, everything of "A" quality may be crimson; "B," blue; "C," buff; and so on for each grade, taking care to use the same sequence of tints for the different qualities of goods of other materials. Or the uniformity may be in kind, not in quality—*i.e.*, all table-spoons may be ticketed in one colour, desserts in another, and teas in a third, all cruets alike, and also teapots, coffees, &c., each after its kind. So long as one principle is carried strictly through all the stock, it is optional on what grounds the selection be founded. If the colours be allotted in accordance with the designed plan of window-dressing, and shelf, case, and counter arrangements, and with a little thought as to chromatic complements and contrasts, the ticketing, so far from being a disfigurement, may be made generally decorative, and help to show off to the best advantage all articles displayed for sale. As to the best sort of tickets, the ideal for all sizes and purposes has yet to be discovered. It is not difficult to indicate what ought never to be seen in a self-respecting ironmonger's. The sprawling chalk marks and big dabs of blue or ochre, beloved of oilmen, are in every way objectionable, as are also unbordered tickets, written or printed, white or coloured, of any material. Writing is unadvisable, if occasionally inevitable. The nearer pen figures resemble bold, stiff copperplate, the less mean and slovenly they look in this connection. In addition to cardboard, parchment, porcelain, ivory, slate, wood, iron, rubber, &c., are more or less in use. When articles or parcels are not too small, enamelled-metal price-tablets, after the style of London street name-plates, but on various coloured grounds, look well. There is no special reason for confining shop-tickets to one material any more than to one colour, if good taste be exercised in the variations. The diversity need not become *bizarre*. I may summarise the chief things to be aimed for as being the indication of some obvious system, a due relation between the sizes of tickets and the articles to which they are affixed, neat shape and bold borders or edgings, the best printing or professional writing, clips or key-ring attachments in lieu of string or gum for parcels, and in addition to the common custom of merely leaving the ticket or slipping it loosely into a corner of the article; above all, figures tempting to the pocket plainly displayed in colours agreeable to the eye, an absolute interdict against writing prices on the article itself or on wrappers or labels, though this may be done when goods are on cards and there is a suitable margin left for the purpose.

In addition to the antique or "fashionable" minority, who may, perhaps, better continue in the old groove of non-pricing, and the pushing majority, who may be counselled to follow the lines of a cash business, as indicated above, like their prosperous neighbours of other trades, some notice must be given to what I will designate the Regent Street, Oxford Street, and Cheapside systems. In the former the tickets are written thus:—"12/6 (Cash Discount, 10 %)." Oxford Street writes, "~~12/6~~ (Reduced to 11/- Cash)." Cheapside prefers "12/6 – Cash Discount, 20 % = 2/6 = 10/- net." As some firms of good standing work on each of these lines, it must be presumed *they* find it successful. Imitators have been less fortunate. Men are prone to declare it all a farce, "a mere clapping on 1*s.* to take off 6*d.*," and so on. Ladies who have regular accounts are apt to be offended if they cannot have their desire for goods booked at the cash price, but on their usual credit. The necessarily large tickets do not improve the appearance of a window dressed even with the taste and quality of Cheapside, and quite spoil suburban exhibitions of lower grade. Ironmongers must, of course, feel the local pulse, and judge for themselves if it is likely to be excited by discounts. As a rule, however, I think the drapers' style of net cash is more taking, using discounts only to effect *bonâ-fide* clearances at special seasons.

In conclusion, I will venture a reminder that the best hope for the prosperity, and even existence, of the ironmonger as a separate tradesman rests on his reputation for trustworthiness and thorough knowledge of his business, so that, both as to his spoken words and his tickets, the public may continue to regard his "yea" or "nay" as honest guarantees as to price and quality

PROTOTYPE STANDARDS OF WEIGHT AND MEASURE.

PROFESSOR T. C. MENDENHALL, Superintendent of the United States Coast and Geodetic Survey, read the following paper at the Washington meeting (February, 1890) of the American Institute of Mining Engineers:—

All persons actively engaged in your profession must have a natural interest in the subject of weights and measures. All members of the engineering profession have to do with operations of weighing and measuring—some with measuring more than weighing, and some with weighing more than measuring—but all with both of these processes to a greater or less degree. Methods of weighing and measuring have improved constantly from the earliest times and have kept pace with the advance of other technical processes. It is, therefore, believed that you will be interested in a few remarks concerning some of the more recent advances in relation to the establishment of decimal standards of length and mass in this country. Before speaking of this, I will refer very briefly to some facts which may not be very generally known regarding our customary system of weights and measures. Although the yard is universally accepted as the unit of length, and the pound as the unit of mass, it is not generally understood, I believe, just in what respect the yard is the unit of length, or the pound the unit of mass. That is to say, it is not generally known in what degree these units have been legalised by Acts of Congress. Doubtless, many of you are familiar with the facts which I will briefly recapitulate. The constitution of the United States authorises Congress to establish a system of weights, measures, and coinage. The establishment of a system of coinage, as you know, was one of the first acts of the Government, and the system then adopted is certainly one of the most perfect, if not the most perfect, that the world has yet seen. But, although Congress had the power to establish a system of weights and measures, it has never yet seen fit to exercise this power; that is to say, Congress has never yet passed a law declaring that the yard shall be the standard of length throughout the United States and that the pound shall be the standard of mass. In what way, then, have these units acquired the recognised legal standing which they unquestionably possess? To this question I will reply, that it has come about almost exclusively through the action of the State Governments, as encouraged and assisted by the National Government. In the early part of the present century the subject of weights and measures was involved in great confusion throughout the whole country; the States did not agree among themselves, nor were the same units or standards of weight and measure used exclusively in any one State.

It soon became evident, however, on account of the very important and extensive operations of the general Government in the survey of its boundary-lines and coasts, and also in the collection of duties upon imported goods, that it was important for the Government to select or establish a unit of length and a unit of mass, which might be used in these operations, and in others in which the Government was engaged. The business of surveying the coasts and of collecting the duties was then, as it has been almost continuously, under the direction of the Secretary of the Treasury. The establishment of a unit of length was virtually entrusted to Mr. Hassler, the first Superintendent of the Coast Survey, who selected a certain number of inches—or, rather, certain particular inches—from a scale known as the Troughton scale, which is now in the archives of the Coast and Geodetic Survey. Ten or fifteen years later (about 1828), what is known as the troy pound, which was brought to this country under the direction of Albert Gallatin, during the Presidency of John Quincy Adams, was selected as the unit of mass for purposes of coinage. This was done by definite Act of Congress, and not by the mere direction of a department official, and in this respect this standard of mass takes a higher rank than does the standard of length. This troy pound was adjusted to agree as closely as possible with the British standard, by the celebrated Kater, and was brought

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to this country sealed, and shortly after its arrival the seals were broken with considerable ceremony by President Adams. This standard is at present, and has been during most of its life, deposited in the Mint at Philadelphia. It is an imperfect standard in its construction and in its form, and is by no means up to the requirements of modern metrological science. But, in 1836, in order to encourage uniformity in weights and measures throughout the whole country, Congress passed an Act providing for the construction, by the Bureau of Weights and Measures, which has always been under the direction of the Superintendent of the Coast and Geodetic Survey, of accurate copies of these standards, together with capacity-measures of various kinds, which were to be distributed to the various States in the Union. The effect of this distribution has been to insure practical uniformity in weights and measures throughout the country. In the absence of positive legislation by Congress upon the subject, nearly if not quite all of the States have enacted laws in which they have adopted the standard yard, or rather each its own copy of the Treasury standard, as the standard of length for the State, and a standard of mass which is, also, a copy of, or derived from, the Treasury standard.

From this bit of history, with which, doubtless, many of you are already familiar, you will learn that, while Congress has never really legislated to provide these very important and necessary standards for the use of the whole country, practically the same result has been attained through the adoption by the State legislatures and general assemblies of the distributed copies of the Treasury originals. It is to be regretted, however, that this leaves us in the condition of having in this country a multiplicity of standards—forty or fifty, perhaps—instead of a single standard, which would have been theoretically, if not practically, more desirable. It is an interesting and important fact that the first standards of length and mass which were really legalised by Act of Congress for the whole country were the metric standards. In 1866 an Act was passed making the use of the metric system permissible in the United States and establishing legal equivalents among the various units and denominations of that system and the customary system. By Act of Congress it was also provided that each of the institutions of learning, known generally as the land-grant colleges, should be provided with a set of metric standards, including a metre and a kilogramme, with the multiples and sub-multiples of the latter, and also with the metric measures of capacity. As Congress had acted upon the matter no State action was necessary to legalise the use of this system, and I believe that none was had by any of the States. The Bureau of Weights and Measures is in possession of many interesting and accurate copies of the metre of the archives, and from these the standards thus distributed were obtained.

The next important step was taken in the year 1869, when the French Government issued an invitation to various countries to send delegates to an International Commission to meet in Paris in the summer of 1870. The object of this Commission was to consider the question of constructing an international standard metre which should represent with all possible accuracy the actual length of the metre of the archives, and which should be more in accordance with the demands of modern metrology. At the short session which was held in 1870, it was agreed by this Commission that a committee should be appointed to make experimental researches, especially with the view of determining the best form for the international prototypes and the best material for their construction. The United States was represented upon this committee, which began its operations early in the year 1872. In the autumn of that year the International Commission met again, and at that meeting twenty-five nations were represented by forty-three delegates. It was there determined that the international metre should have the length of the metre of the archives at zero Centigrade, and that it should be composed of an alloy of platinum and iridium, 90 per cent. being platinum and 10 per cent. iridium. It was also agreed that the composition of the kilogramme should be the same as that of the metre; that its mass should be derived from the kilogramme of the archives in its actual present condition, and that it should be determined with reference to its weight in a vacuum. It was also decided to enlarge the scope of the Commission by the establishment of an International Bureau of Weights and Measures, and this proposition having been submitted to the various Governments, a treaty to that effect was signed at Paris in 1875. Previous to this time the experiments of the committee charged with construction had led to the production of what is known as the alloy of 1874, which was cast in a single ingot weighing 250 kilogrammes.

Although upon analysis this alloy was found to contain such impurities that it was thought best by the International Commission to reject it, yet certain standards or units were prepared from this alloy, and one of these is in the possession of the Office of Weights and Measures in Washington. It was not until about the year 1882 that the difficulty in the way of preparing raw material for the construction of these standards was overcome. The method of preparing this alloy is described as follows:—For the kilogrammes pure platinum and iridium in a finely powdered state were weighed in the proportions sought, and well mixed in quantities of 10 kilogrammes at a time. Each of these quantities was compressed into a cake and heated to a red heat in a covered platinum crucible. Each cake was then put into a furnace of pure lime and melted with an oxyhydrogen flame and then poured into moulds, also made of pure lime. After various other processes the ingots were forged under a powerful hammer. After forging, the metal was passed between polished steel cylinders and reduced to plates about 2 millimetres thick. Finally, all the metal was melted, as before, for a third time in May, 1884, and cast in a single ingot weighing 65 kilogrammes. The metal thus obtained was heated in a specially-constructed lime-furnace, then forged under a hammer into a square bar 52 centimetres long by 7 centimetres thick. This, in turn, was heated and rolled between steel cylinders into a cylindrical bar 200 centimetres long and 44 millimetres thick, and at this stage pieces were cut off the ends and analysed, and found to be pure. This bar was cut into forty cylinders for the standard kilogrammes.

The metal for the metre-bars was prepared in about the same way. After the several meltings, the mass was divided into five lots. These having been examined and found to be pure and homogeneous were each divided into three parts. These were then arranged in groups made up from each of the five lots, melted together and cast into ingots, each of which contained sufficient material for one standard. The bars, after having been forged, were passed between rollers until they assumed approximately the shape desired. This operation required 3 days, 16 hours each, for each bar; *i.e.*, two bars a week were planed, saving accidents. The bars were then cut to exact length (1·02 millimetre), their edges were made straight and the neutral surface was made plane. The polishing and tracing were then done at the Conservatoire des Arts et Métiers.

Great care was taken in ascertaining the coefficient of expansion of all of the bars after their preparation, one being selected and studied by the usual method for determining this constant, and the coefficient of the other bars being determined relatively to this one by comparison at various temperatures. Thirty bars were prepared and very carefully compared with each other, and it was found that none of them differed as much as three one-thousandths of a millimetre from the metre of the archives. That one which was closest in agreement, and which was altogether the best for the purpose, was selected by the committee and set aside as the international standard metre, thus taking the place, as a matter of fact, of the metre of the archives. The remaining bars were distributed by lot to the various contributing countries. Forty-two kilogrammes were constructed. Their densities were determined by the most accurate processes, the weighings being made in a balance especially constructed for this work, which was capable of weighing *in vacuo*, although the actual weighings were made in air. The actual construction of the balance permitted the transposition of the standards and a manipulation of the weighings without approaching the balance nearer than about 4 metres.

An analysis of the material of which these standards are composed showed that it was almost exactly in accordance with the original plan, that is to say, that it contained 90 per cent. platinum and 10 per cent iridium. There were traces, however, of rhodium and iron. The two metres which came to the United States in the allotment were Nos. 21 and 27, and that of the alloy of 1874 is No. 12. Of the kilogrammes we obtained Nos. 4 and 20. The equation of these standards is given below:—

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EQUATION OF THE UNITED STATES PROTOTYPES.

Metres. Micron.

No. 21 = 1 + 2·5 + 8·665 T + 0·00100 T²
No. 27 = 1 − 1·6 + 8·657 T + 0·00100 T²

Alloy of 1874.

No. 12 = 1 + 3·3 + 8·631 T + 0·00100 T²

Kilogrammes.

		Mg.	Density	Volume, c c.m.
No. 4	= K −	0·0857 ..	21·5436 ..	46·4176
No. 20	= K −	0·0398 ..	21·5509 ..	46·4017

These values of the national prototypes were determined at the International Bureau of Weights and Measures by a very elaborate series of comparisons between them and the international prototypes. In the above equations the "micron" is the one-millionth part of a metre; "T" is the temperature in degrees Centigrade.

The following comparison between the new prototypes and the metre des archives sets forth the advantages of the former:—

Rigidity		Superficial Area of Transverse Section	
New Prototypes	Metre des Archives	New Prototypes Sq. Mm.	Metre des Archives. Sq. Mm.
25·9	1	150	100

The construction of these standards was completed in the autumn of last year, and those allotted to us were received by Dr. B. A. Gould, our representative in the International Bureau and were by him turned over to the United States Minister at Paris, Mr. Whitelaw Reid. Metre No. 27 and kilogramme No. 20, and also metre No. 12, of the alloy of 1874, were received from the United States Minister by Professor George Davidson, Assistant in the United States Coast and Geodetic Survey, who brought these standards from Paris to Washington, where they were deposited in the Office of Weights and Measures. The utmost care was necessary, and was shown, in the transportation of these standards, and I am glad to say that they were received at the Office of Weights and Measures in excellent condition. On January 2, 1890, the metre No. 27 and the kilogramme No. 20 were carried to the cabinet-room in the executive mansion, where the ceremony of breaking the seals upon the boxes was performed in the presence of the President of the United States, the Secretary of State, and the Secretary of the Treasury, together with a distinguished company of scientific men, including the presidents of the engineering societies of the country, and all leading exponents of the science of metrology. A formal certificate, declaring the condition of these standards on the opening of the boxes, was signed by the President and witnessed by the Secretary of State and the Secretary of the Treasury. A somewhat similar certificate was signed by all the other gentlemen present at the ceremony of breaking the seals. By this official act of the President of the United States, metre No. 27 and kilogramme No. 20 are placed in a rank above that of any other standards which we now possess, and they will, therefore, be guarded as our national prototype metre and kilogramme. Metre No. 21 and kilogramme No. 4 are still in the possession of the United States Minister at Paris, and will be brought to this country by a special messenger from the Office of Weights and Measures during the coming summer.

In thanking you for your kindness in granting me the privilege of discussing this question before you this evening, allow me to say that the Office of Weights and Measures will always be pleased to do anything in its power to further the interests of exact measurement in any operations growing out of the practice of your profession. We can determine the errors of your standards of length if you desire it, and of your standards of mass also. We have recently published a two-page table for the transformation of the customary system of weights and measures to the metric system, and I have placed a number of these upon the table which I should be pleased to have any of you appropriate when an opportunity is offered, if you so desire.

THE UPPER SILESIAN ZINC INDUSTRY.

AFTER iron, zinc is the most important metallurgical industry in Germany, for, whilst that country is still considerably distanced in iron-ore and pig-iron production by Great Britain and the United States, it is a long way ahead of all other countries as a producer of zinc ore and finished zinc. The annual output of zinc ore in Germany so far back as 1848 was 160,736 tons. By 1862 this quantity had grown to double these figures, and in 1889 the amount was 708,000 tons. The manufacture of zinc has developed even more rapidly, for whilst in 1848 only 21,200 tons were prepared, in 1889 the total make aggregated some 136,000 tons.

The chief seat of the industry is in Upper Silesia, but there are branches in Westphalia, on the Rhine, and in Saxony. Upper Silesia, however, is credited with two-thirds of the German and one-third of the total European output, which is estimated at 260,000 tons per annum. During the period under review the value of the metal has also augmented. In 1882 the average selling price of crude zinc was 252·8m. per ton, whilst in 1889 it had grown to 360m. In Upper Silesia, in addition to the preparation of crude zinc, the manufacture of zinc white and zinc sheets is regularly carried on. The introduction and steady development of railways in Germany has largely contributed to the growth of the zinc trade. With the opening of the Breslau-Posen line in 1856 the transport of the metal was almost entirely tranferred to the railway; and when, three years later, the Upper Silesian narrow-gauge mineral lines were opened a still greater impulse was given to the trade. In Germany, however, as in some other countries, the advantages of water transit in point of cheapness are once more under discussion, and efforts are now being made to secure such improvements in the waterways of the Upper Oder by canalisation and other means as shall enable the zinc-makers to send their goods down and bring coal up by water—a double economy which cannot fail to still further improve the position of the zinc-manufacturing business.

THE PRODUCTION OF PIG IRON IN AMERICA.

REPORT OF UNITED STATES CENSUS.

By Dr. William M. Sweet.

THE production of pig iron during the year ended June 30, 1890, was the largest in the history of the iron industry of this country, amounting to 9,579,779 tons of 2,000 lbs, as compared with 3,781,021 tons produced during the census year 1880 and 2,052,821 tons during the census year 1870. From 1870 to 1880 the increase in production amounted to 1,728,200 tons, or nearly 85 per cent., while from 1880 to 1890 the increase was 5,798,758 tons, or over 153 per cent. The following table shows the production of pig iron in the various sections of the country in the census years 1870, 1880, and 1890, in tons of 2,000 lbs., including castings made direct from the furnace. The statistics for 1870 and 1880 are for the census years ended May 31, but for 1890 they cover the year ended June 30.:—

(Tons of 2,000 lbs.)

Districts	Year ended May 31, 1870	May 31, 1880	June 30, 1890
North-Eastern States	34,471	30,957	33,781
Middle States	1,311,249	2,401,093	5,216,591
Southern States	184,540	350,436	1,780,909
Western States	522,161	995,335	2,622,351
Far Western States	—	3,200	26,147
Totals	2,052,821	3,781,021	9,579,779

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From the above it will be seen that the pig-iron industry of New England has been practically stationary during the same past twenty years, while during the same period, and especially since 1880, there has been a wonderful development of the manufacture of pig iron in all other sections of the country.

The following table gives the production of pig iron by States, in tons of 2,000 lbs., including castings made direct from the furnace, during the census years 1880 and 1890, with the number of completed furnace-stacks at the close of each year, the relative rank of each State, and its percentage of the total production:—

Year ended May 31, 1880.

Rank	States and Territoriss	Completed Furnace-stacks	Production of Pig Iron in Tons	Percentage of Total Production
1	Pennsylvania	269	1,930,311	51·05
2	Ohio	103	548,712	14·51
3	New York..	57	313,368	8·29
4	New Jersey	20	157,414	4·16
5	Michigan	27	119,586	3·16
6	Wisconsin..	14	118,282	3·13
7	Illinois	10	95,468	2·52
8	Missouri	17	95,050	2·51
9	West Virginia	11	80,050	2·12
10	Alabama	15	62,336	1·65
11	Maryland	22	59,664	1·58
12	Kentucky	22	58,108	1·54
13	Tennessee	21	47,873	1·27
14	Georgia	10	23,099	2·51
15	Connecticut	8	18,779	
16	Indiana	4	18,237	
17	Virginia	31	17,906	
18	Massachusetts	6	9,543	
19	Oregon	1	3,200	
20	Maine	1	2,015	
21	Texas	1	1,400	
22	Vermont	1	620	
23	Minnesota..	1	—	—
24	North Carolina	7	—	—
25	Utah	2	—	—
—	Totals	681	*3,781,021	100 00

* Includes 4,229 tons of castings made direct from furnace.

Year ended June 30, 1890.

Rank	States	Completed Furnace-stacks	Production of Pig Iron in Tons	Percentage of Total Production
1	Pennsylvania	224	4,712,511	49·19
2	Ohio	71	1,302,299	13·59
3	Alabama	48	890,432	9·29
4	Illinois	15	674,506	7·04
5	New York	37	359,040	3·75
6	Virginia	31	302,447	3·16
7	Tennessee	19	290,747	3·04
8	Michigan	26	224,908	2·35
9	Wisconsin	10	210,037	2·19
10	New Jersey	18	145,040	1·51
11	West Virginia	5	108,764	1·14
12	Missouri	8	99,131	1·04
13	Maryland	14	96,246	1·00
14	Kentucky	6	44,199	1·71
15	Georgia	5	35,747	
16	Connecticut	8	21,700	
17	Colorado	2	12,949	
18	Indiana	2	11,470	
19	Texas	4	8,950	
20	Oregon	1	8,411	
21	Massachusetts	4	8,381	
22	Washington	1	4,787	
23	Maine	1	3,700	
24	North Carolina	1	3,377	
25	Minnesota	1	—	—
—	Totals	562	*9,579,779	100 00

* Includes 9,929 tons of castings made direct from furnace.

Notwithstanding the fact that the production of pig iron has increased from 3,781,021 tons of 2,000 lbs. in 1880, in 9,579,779 tons in 1890, the total number of completed furnaces has decreased during the ten years from 681 to 562. Many furnaces which were in the active list in 1880 have since been abandoned, owing to their inability to profitably compete with the larger, better located and more modern furnaces of the present day. The majority of these abandoned furnaces were of small capacity, and were able to produce and market pig iron only during periods of great demand and consequent high prices, while the large number of new and improved furnaces which have been built during recent years, and which are favourably located for the supply of materials at low cost and within easy access to market, have now made the operation of these antiquated furnaces unremunerative even in periods of great activity.

At the close of the census year 1890 the total number of blast-furnaces which were active or likely to be some day active was 562, of which 169 were anthracite or anthracite and coke furnaces, 253 coke and bituminous-coal furnaces, and 140 charcoal furnaces. Of the total number of furnaces at the close of 1880 there were 229 anthracite or anthracite and coke furnaces, 195 coke and bituminous-coal furnaces, and 257 charcoal furnaces. In the decade from 1880 to 1890 there is seen to have been a decrease of 60 in the number of anthracite or anthracite and coke furnaces, a decrease of 117 in the number of charcoal furnaces, and an increase of 58 in the number of coke and bituminous-coal furnaces.

Of the 562 completed furnaces at the close of the census year 1890 there were 338 in blast, of which 110 were anthracite ar anthracite and coke furnaces, 165 coke and bituminous-coal furnaces, and 63 charcoal furnaces. The number of furnaces building at the date mentioned was 39, of which 9 were in Virginia, 7 in Alabama, 5 in Pennsylvania, 4 in Illinois, 3 each in Kentucky, Tennessee, and Michigan, 2 in Maryland, and 1 each in Georgia, Ohio, and Wisconsin.

One of the most noticeable features in the growth of the manufacture of pig iron in this country during the past decade is the development of the blast-furnace industry of the Southern States. In 1880 the South had already commenced to appreciate the value of the extensive deposits of iron ore and coal within her borders, and to realise the superior advantages which she possessed for the cheap production of pig iron, owing to the close proximity to each other of these materials, and a number of large coke-furnaces were built in that year and the few succeeding years. The greatest activity, however, in undertaking new furnace plants was in 1887, during which year 5 new furnaces were blown in and 25 others were under construction. There has been but little abatement in this activity to the present time.

The following table shows the production of pig iron in the Southern States during the census years 1880 and 1890 in tons of 2,000 lbs., with the percentage of increase or decrease of each State since 1880:—

States	Year ended May 31, 1880	Year ended June 30, 1890	Percentage of Increase in 1890
Alabama	62,336	890,432	1,328·44
Georgia	23,099	35,747	54·76
*Kentucky	58,108	44,199	—
Maryland	59,664	96,246	61·31
North Carolina	—	3,377	—
Tennessee	47 873	290,747	507 33
Texas	1,400	8,950	539·29
Virginia	17,906	302,447	1,589·08
West Virginia	80,050	108,764	35·87
Totals	350,436	1,780,909	408 20

* Decrease, 23·94.

The greatest activity in the development of the Southern pig-iron industry during the past decade is seen to have been in Alabama. This State produced in the census year 1890 one-half of all the pig iron made in the South, and was only exceeded in production in the United States by Pennsylvania and Ohio. Virginia and Tennessee now occupy respectively second and third places among the pig-iron producing States of the South. Prior to the census year 1890 Tennessee was the second leading manufacturer of pig iron in that section, but the activity which has been noticeable during the past few years in Virginia in the erection of new furnaces has placed this State next to Alabama among Southern States in the quantity of pig iron produced. In 1880 West Virginia

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was the leading producer of pig iron in the South, but in 1890 it was fourth in rank. The manufacture of pig iron in Kentucky and Georgia has been practically stationary during the past decade, and prior to the census year 1890 but little progress had been made by Texas. Two charcoal-furnaces were building in that State in the census year 1890, both of which were completed but not blown in at the close of that year. All of the furnaces in North Carolina, seven in number, were idle in 1880, and since that year very little activity has been shown in the erection of new works, while the seven furnaces referred to have either been abandoned or are now classed as long-inactive furnaces. The only active furnace in that State at the present time was built at Cranberry in 1884 to smelt the ores of the Cranberry district, using charcoal as fuel; but during the latter part of the census year 1890 this furnace used coke as fuel. With the exception of West Virginia and Maryland, nearly all the pig iron made in the South is produced from Southern ores, and of the quantity produced by the use of mineral fuel much the larger part is made from Southern coke. Most of the pig iron made in West Virginia is produced from Lake Superior ores. In Maryland the recent building of four large coke furnaces by the Pennsylvania Steel Company at Sparrow's Point, near Baltimore, to smelt iron ores from Cuba, has suddenly brought this State more prominently forward as a manufacturer of pig iron. Two of the furnaces were blown in during the census year 1890, and of the other two one is completed and ready for operation.

The following table gives the production of pig iron, in tons of 2,000 lbs., exclusive of castings made direct from the furnace, in each pig-iron producing State during the census year ended May 31, 1880, and for the year ended June 30, 1890.

Total Production of Pig Iron (exclusive of Furnace Castings).

States and Territories	Year ended May 31, 1880	Year ended June 30, 1890
	Tons	Tons
Alabama	62,338	890,360
Colorado	—	12,949
Connecticut	18,779	21,700
Georgia	23,099	33,747
Illinois	95,468	674,506
Indiana	18,237	11,470
Kentucky	58,015	44,199
Maine	2,015	3,700
Maryland	59,644	96,946
Massachusetts	9,543	8,381
Michigan	119,500	224,817
Minnesota	—	—
Missouri	95,050	59,048
New Jersey	167,364	144,910
New York	313,206	389,030
North Carolina	—	3,377
Ohio	547,701	1,202,061
Oregon	3,200	8,411
Pennsylvania	1,928,094	4,707,441
Tennessee	47,733	290,697
Texas	1,400	7,150
Utah	—	—
Vermont	600	—
Virginia	17,785	202,152
Washington	—	4,787
West Virginia	79,743	168,734
Wisconsin	118,150	209,977
Totals	3,776,792	9,769,850

Commercial Failures.—The number of failures in England and Wales gazetted during the week ending Sept. 13 was 66. The number in the corresponding week of 1889 was 65, showing an increase of 1, being a net decrease in 1890, to date, of 433. We enumerate the failures amongst the following trades, and give the number in each in the corresponding week in 1889:—

	1890	1889
Building and timber trades	9	9
Coal and mining trades	—	2
Hardware and metal trades	2	—
Iron and steel trades	1	—
Jewellery and fancy trades	4	—

SURFACING IRON AND STEEL.

WHEN iron or steel leaves the mill in which it is manufactured, or the foundry in which it is cast, it is coated with the oxidised scale incident to the process of manufacture. Very few of these products are, in this condition, ready for the use to which they are finally to be put. They must receive some other finishing of the surface to prepare them to resist further oxidisation or to present a creditable appearance. Rails and railway track supplies, although subject to exposure, require no further coating, as their deterioration comes less from rust than from wear and tear. Structural not exposed to view or to the weather requires no further coating, but these are exceptions. Various methods for producing the surface appropriate to the work are adopted as circumstances require. These may be classed under the heads of (1) coating with paint, (2) coating with other metals, (3) changing the condition of the surface of the metal itself. Coating with paint is done either in the same manner in which paint is applied to wood, letting it dry in the same manner, or the article is covered with asphaltum in some form and the coating is hardened by heat. Large pieces of cast-iron on which it is desired to have a smooth paint finish are first well cleaned from the sand and then covered with some kind of paint or filling which is laid on to a sufficient thickness to cover all roughness after it is rubbed down. It may afterwards be painted in the style desired, and such a degree of excellence has been attained in this art that surfaces are produced nearly as hard as those made by the application of heat. In the hot process the article to be covered may be heated to such a degree that when it is immersed in a bath of coal tar and removed therefrom the coating is harder than an oyster-shell. It does not form a good surface to lay paint upon the paint strays like water on grease.

Specifications for coating water-pipe for the Chicago mains read: "When the pipe is thoroughly cleaned it shall be heated to 300° Fahr. and immersed in a bath of coal pitch varnish of equal temperature. When the pipe is removed from the bath this coating shall fume freely and set perfectly hard within one hour from removal." Sewing-machine beds and frames, piano frames, and similar articles, are covered with an asphaltum varnish and dried in an oven heated to 300° and upwards. The coating becomes quite hard, but is not as brittle as where greater heat is employed. The pieces are rubbed down with pumice stone. As many coats are given as may be necessary to produce the desired smoothness of surface, which may be painted upon with whatever colours are desired. Asphaltum baths, prepared with benzine, are heated by steam-pipes, and are used for coating work which may be immersed in them. After removal the work is hung in a warm place to drip, and in a short time becomes hard. The surface put on by this method may also be painted upon. The paint lays on it well. This is fortunate, as the practice of painting all ironwork black on certain manufactures is nearly obsolete.

Other methods of finishing the surface of iron and steel require that the scale of forging and casting shall be removed. The scale is removed from some articles of malleable iron, and they are given a very fair appearance, by the simple process of tumbling a lot of them together in a revolving barrel. When a higher polish is required, pieces of wood and leather are put in among the iron pieces, and wear them to a good degree of brightness. Tumbling was formerly the cause of a great amount of flying dust in the vicinity of the operation, but, since the adoption of the exhaust barrels, this annoyance is removed by circulation of air, which carries the dust away. Workmanlike finish—bright, is put upon work by different machining processes, which remove the scale and surplus material with cutting tools, after which the work is filed and smoothed with emery paper, and finally with fine-grained oil-stones. Very artistic designs are thus wrought out, and it is evident that the workman who can stone a piece of work uniformly is possessed of the artistic instinct. Scraped surfaces are for utility rather than for appearance, although it is sometimes the case that the ostentatious scraping proves to have been done more for appearance than for utility. It is the machinist, however, who dis-

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covers this fact. The emery wheel is the tool which puts the bright polish upon cutlery. It revolves with great rapidity and brings the particles of emery in contact with the work with such force as to send a stream of sparks flying from it in a blaze. A newspaper reporter, seeing one in operation in Edison's manufactory, is said to have been more impressed with its sparkling properties than with any other object he saw, and described it with great vivacity as a wonderful exhibition of electrical phenomena. It was a very natural mistake. Wheels covered with emery of different degrees of fineness are used. When the Miller cutlery business was instituted twenty-five years ago in Meriden, Conn., Mr. William Miller, the senior partner, said that the workmen most difficult to obtain in this county were those who were capable of putting the high polish on cutlery. His thorough acquaintance with the mechanical development of the times made his statement of value. But brightness is of no value on iron or steel articles which are to be exposed to the weather, as they would soon rust. It is necessary to resort to other methods of putting a fine appearance upon goods which require it. There are three methods employed for changing the surface from the bright finish to other styles which are as attractive. These are by case-hardening, by blueing and by browning.

Case-hardening is a process which creates a hard skin of greater or less thickness upon the outside of iron articles, by converting it into steel and quenching it at a red heat. The operation may be so performed as to present a highly pleasing variety of ornamental colouring—a plain jet black, or a fire-marked surface, hard, which will receive a high polish, more enduring than it could take when soft. For colours, the pieces after being finely polished, are inclosed in an iron box and packed in animal charcoal (granulated bone or burned leather). These are then heated to a full red heat, at which they are allowed to remain for a sufficient time (one to three hours) to get the hardened skin of the proper depth. Care is taken to get them quickly into the water without exposure to the air, as this would destroy the colours. If they are wanted black, they are cooled in oil instead of water. When colour is not the object, but hardness only is required, they are kept hot longer, and are cooled in the quickest possible manner. There is a richness and beauty about the blue colour which can be produced on steel which is unsurpassed by any other colouring. Look at the heads of screws in a watch; can anything be more beautiful? To produce the highest effect the highest polish is required. Wrought iron will take blueing as nicely as steel if it is fairly homogeneous. Cast iron will take a blue, as will also malleableised cast iron, but these are liable to be cloudy in their appearance, owing to the difference in the internal structure of the iron. If one place is cut deeper than another, it is liable to be of a lighter colour. It is for the same reason that hardened steel takes better colours than unhardened—the grain is closer and internal chemical conditions more favourable. The operation is performed by heating the highly-polished pieces in sand or in very clean granulated vegetable charcoal. As the heat required just touches on the red the charcoal ignites and slowly consumes. The pieces are thoroughly cleaned and buried in the hot charcoal. It is curious to watch them when they are taken out as bright as when they were put in, and observe, as soon as they are exposed to the air, how the colours suddenly come out upon them with a flush, always running up in the regular gradations, however, beginning with a light straw. They are taken out and dusted off frequently before the full colour is reached. They are then removed from the fire, allowed to cool, and subsequently oiled. In some large establishments a method of blueing a darker blue with oils has been used with success.

Browning is done with acids which are laid upon the bright surfaces and allowed to act for a limited period. They are then scratch-brushed and well rubbed, and submitted again to the action of the acid. The repetition of these operations results in an even action of the acid all over the surface, local action of one biting being corrected by the next. Finally all traces of the acid are thoroughly washed out, the pieces being heated to allow the lime-water to effectually remove it. They are then oiled; and this coat of brown oxide thus prepared and rubbed down is found to be a protection against ordinary rust. Something of this nature is the Barff method of protection. By this method the piece to be operated upon is heated to a temperature of from 500° to 1,200° Fahr., and surrounded with an atmosphere of steam. The black oxide is thus raised. This coating is similar to that on Russia sheet iron, which affords very complete protection.

Coating with metals is done either by electro-deposition, simple immersion in solution, immersion in melted metal, or by soldering. Of late years nickel-plating has become a favourite, as it is a highly ornamental mode of finishing iron goods. The nickel is in solution in tanks, and the pieces, highly polished, are hung on copper conducting-rods opposite to plates of metallic nickel (anodes) which are hung on conducting-rods of the opposite electricity. The current passes through the solution, particles of nickel are carried to the work, and, settling on it, gradually cloud it over until the cloud becomes a film of tangible thickness. When the thickness is sufficient the pieces are removed from the bath, washed, dried, and buffed with rouge on a rag wheel. The pieces must receive as high a polish before they are immersed in the bath as they are intended to have when finished. This is one of the secrets of the art. Copper plating on iron is done in the same manner. The first coating copper solution must not be acid. Many experiments have been made to obtain good quick depositing neutral solutions, but not with much success. After, however, a bare film has covered the work in a neutral solution, it may be cleansed and removed to the sulphate solution, which is an extraordinarily rapid depositor. By this means, with the adoption of the roller condensing methods, coatings of any required thickness of copper, may be deposited on iron. As an instance of simple immersion, the coating of iron and steel wire by dipping in a sulphate of copper solution may be cited. It gives a good colour to the wire, but it is not very efficient as a protector from rusting.

Galvanising and tinning are modes of coating with molten metal. Galvanising is only a conventional term for the process of coating iron with zinc, which is a misnomer. The process of coating iron with molten metal consists in thoroughly cleaning the surface of the iron free from all foreign matter and from rust and scale by first submitting it to the action of dilute acid and afterwards washing this off. It may then be dipped in a solution of chloride of zinc and sal ammoniac, eight to one, and after being carefully dried and moderately heated to ensure the absence of moisture it is placed in the pot of hot metal and allowed to remain until it has acquired the temperature of the bath. When it is removed the metal is so fluid that any superfluity readily drops off. Silver plating, such as is used on fine harness, is put on by the old method of soldering. The pieces to be plated are first given a coat of soft solder; the silver is then cut from sheets of whatever thickness the plating is to be, in shapes approximating to what is needed to cover the part which is undergoing the operation. It is laid on and rubbed with the soldering-iron until the two metals are firmly united together. The silver, being soft, is easily made to conform to the shape of the article on which it is laid. In skilful hands this is an excellent mode of plating. Enamelling is the coating of the metal with porcelain. The clay is laid on the clean surface of the iron, and when well dried the pieces are heated in a muffle to a low red heat until the porcelain is baked. Other coats are applied in the same manner until the proper thickness is obtained. Any colours which are to be used for ornamentation or the lettering on signs are then painted on, after which the glazing is applied and burned on. The difference in expansion between metal and porcelain at artificial temperatures is a very trying ordeal, to which enamelled pieces are subjected, but at ordinary temperatures the union is very durable.—B. F. SPAULDING, in *Age of Steel*.

Fatal Accidents.—On Tuesday morning George Walker, aged 52, died in the Rotherham Hospital from injuries received twelve hours before at the Parkgate Iron and Steel Works. Walker was passing a bar through the rolls when it unexpectedly turned over, causing the red-hot metal to enter his abdomen.—Late on Monday night Albert Butler, aged 25, was killed in the steelworks of the same establishment. A part of Butler's duty was to place ingot-moulds in the pit ready for the metal from the Siemens furnaces. While riding on a crane to the place where the ingots were stored the "jib" struck him, causing instant death.

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IRON, STEEL, AND FUEL.

LONDON, Thursday Evening.

Pig Iron. — The prospect of labour troubles and the increasing dearness of fuel have contributed to the present strength of the market both on speculative and consumptive account, and the feeling is pretty unanimous that, come what may, existing prices will have to be regarded as a minimum rather than one from which an early fall may be expected. In short, the present position, instead of indicating a boom-like future, is full of anxieties, and the utmost caution is needed in order to steer clear of danger. Meantime the warrant market has made fairly steady progress towards higher levels, and makers have not been slow to raise their quotations for their special brands. On the London Exchange the business done since our last report has not been very extensive. On Friday of last week about 4,000 tons changed hands at 50*s* 2*d*. cash. On Monday 12,000 tons were done at 50*s*. 7*d*. cash, and about £0*s*. 11*d*. one month. The transactions on Tuesday were small, amounting only to 2,500 tons. In the morning 50*s*. 8*d*. ruled for cash, and 1*d*. more for September 26. Later in the day cash touched 51*s*., but only one or two warrants changed hands. Hematites have ruled pretty steady all the week at about 57*s*. 6*d*. to 58*s*. 4*d*., the fluctuations being more upward than downward. The ruling rates on Wednesday ranged between 51*s* 1*d*. to 51*s*. 3*d*. cash and 51*s*. 4*d*. to 51*s*. 6*d*. one month. Business at two months was done at 51*s*. 7*d*. The Glasgow market on Wednesday fluctuated between 51*s*. 1½*d*. to 51*s*. 4*d*. cash and 51*s*. 5*d*. to 51*s*. 7*d*. one month, closing firm at top prices.

Bars, Rods, Hoops, &c. — There is unmistakably more doing in bars, but chiefly for the Australian and Mediterranean markets. The Cape inquiry has eased off, and the South American trade is still dormant, although there are welcome signs of returning life. The sudden spell of hot weather has interfered considerably with the running of the mills, for when opportunity has presented itself for undertaking harvest work many of the operatives have availed themselves of it. Hoops are in normal demand, but recent rates are being fully maintained.

Sheet Iron.—Galvanised sorts are in improved demand, and the better qualities are quoted firm at about 13*l*. 10*s*. for 24 w.g., in bundles, Liverpool. Commoner makes are also in better call, and at present rule steady at 12*l*. to 12*l*. 10*s*. for 24 w.g. This improvement has caused increased activity at the black-sheet mills, and, although there is nothing approaching a rush, yet makers all round are comfortably engaged. Prices are still a little irregular, but their tendency, for the most part, is upward.

Wire and Wire Nails.—The call for netting-wire just now is pretty good, and one or two fair orders have been placed with Continental makers. Other parcels are being negotiated for delivery next year, but, in view of a rising market, makers are rather cautious in their quotations. Business in wire nails is rather quiet again; and it is strange that, although for some days several substantial inquiries on Australian account have been before the trade, yet little or no business has resulted.

Steel.—In the heavier departments there is rather more doing all round, whilst a little additional business has caused some of the makers to be fully booked for the present. In the lighter branches activity continues the order of the day, and values are firmly quoted. Scotch billets of basic make rule at 5*l*. 15*s*. to 6*l*. Steel joists are in request, but differences as to price seem for the moment to preclude business. It is stated, however, that the makers, and those on the Continent particularly, are not in a mood to reduce their rates, considering the labour difficulties and the high rates of fuel and raw materials.

Steel Rails.—Beyond the inquiry for 3,500 tons issued by the Great Northern Railway of Ireland, there are no public specifications before makers. Merchant demand seems also to have slackened somewhat; but, notwithstanding, standard sections are quoted quite as firmly as last week.

Wolverhampton.—The recent improvement in the iron trade is well maintained. Reports brought to 'Change in Wolverhampton on Wednesday showed that galvanised sheets were in better demand, and better sales are being obtained; there being more inquiry from India. The value of spelter is now about 25*l*. 3*s*. 6*d*. in the Midlands, and supplies are limited. Ordinary sheets are in brisker request at 7*l*. 5*s*. to 7*l*. 10*s*. for singles, 7*l*. 15*s*. to 8*l*. for doubles, and 8*l*. 15*s*. to 9*l*. 5*s*. for trebles. Marked bars are in steady out-turn at 8*l*. 10*s*., and common sorts are abundant at 6*l*. 10*s*. upwards. Hoops are 7*l*. 10*s*., and gas-tube strip commands 7*l*. 2*s*. 6*d*. In the pig-iron trade a large business is doing. All-mine cold-blast is 5*l*, and all-mine hot-blast 70*s*. For cinder sorts 43*s*. to 45*s*. is the figure quoted. Derbyshires command 51*s*. 6*d*. to 53*s*. 6*d*., and Northamptons 50*s*. to 52*s*. 6*d*. Pig-iron makers find expenses increasing, especially in the matter of coke. Those ironmasters who have furnaces in blast have mostly made contracts two months ago to last them up to the end of the year, but in cases where extra supplies are required about 2*s*. 6*d*. a ton advance has to be paid on the July rates. The better class of South Wales coke delivered here is now quoted 18*s*. 6*d*. to 1*l*.

Sheffield.—There is an improving tone in the iron and steel markets in this district. Prices are firm, with an upward tendency, and a fairly steady demand. Hematites are quoted at 67*s*. 6*d*.; Bessemer billets, 6*l*. 10*s*.; and Siemens-Martin billets, 6*l*. 15*s*. The demand for crucible cast steel generally is improving, and steel waggon tires and axles are quoted 10*l*. 10*s*, and springs 11*l*. Coal for manufacturing purposes is selling well, with prices steady at present high rates. Best steel coke is securing as much as 27*s*. a ton, whilst inferior qualities are as low as 23*s*. Rolling-mills are plentifully supplied with work, and there is no talk of reducing discounts.

Leeds.—Business done in iron and steel of all kinds indicates a rather more active state of affairs. The demand for best Yorkshire iron is satisfactory, and mild steel plays a more and more important part in the trade of the district.

Lancashire. — Notwithstanding the very strong tone throughout the market and the further upward tendency in raw material, both as regards iron and steel, the weight of buying going on is extremely small. Lancashire makers of pig iron have, however, been stiffening up in their prices, and they are now quoting on the basis of 51*s*. to 52*s*., less 2½, for forge and foundry qualities delivered. With regard to district brands most of the makers are very indifferent about selling at all. Lincolnshire are not quoted under 49*s*, and in some cases 50*s*, for forges, up to 52*s*. and 53*s*. for foundry, less 2½ delivered; whilst merchants who were previously disposed to undersell, finding that makers have so little to offer, and are thus giving them the command of the market, are holding out for better prices than they were previously willing to accept. Derbyshire brands have also stiffened up, and the best foundry qualities now range from 53*s*. 6*d*. and 54*s*. for iron in second hands, up to 54*s*. 6*d*. and 55*s*., less 2½, as makers' quotations for delivery. The same remarks apply to outside brands offering, good foundry Middlesborough ranging from 55*s*. 4*d*. up to 56*s*. 4*d*. net cash, whilst Eglinton is now quoted at 58*s*. 6*d*. to 59*s*., and Glengarnock about 61*s*. 6*d*. net cash delivered. In hematites the business doing has been only of limited extent, but prices are very firm, with also a tendency to stiffen in some instances. Good foundry qualities might here and there still be bought at about 65*s*., but makers who a week or two ago would have been willing to sell at this figure are now quoting 66*s*. 6*d*. to 67*s*., less 2½, delivered. In steel plates only a few orders of no great weight have been given out, but makers are very firm, and for Lancashire and Scotch makes of steel boiler-plates the minimum quotation is 8*l*. 5*s*., with quotations in some instances 8*l*. 7*s*. 6*d*. for delivery to consumers, although steel plates from the Barrow district have been obtainable at about 5*s*. per ton under these figures. The finished-iron trade does not show any very appreciable improvement. For good Lancashire and North Staffordshire bars delivered the average quotation is 6*l*. 10*s*. per ton. In hoops there is a good deal of pressure to complete shipments for America, and makers are very firm at 6*l*. 15*s*. as their quotation for delivery. Sheets are generally quoted from 8*l*. to 8*l*. 5*s*. per ton, according to quality, for delivery. In the coal trade the demand is only quiet, and, although there is no giving way upon official

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quotations, there is a fair amount of coal, which accumulates under load at the pit-banks, offering at below list rates, with the result that there is rather a want of firmness in current market prices. House-fire coals are in fair demand for the season of the year; common round coals for steam and forge purposes are moving off tolerably well, but are plentiful in the market; and engine-fuel, especially as regards the commoner sorts of slack, continues rather a drug, with sales pushed at very low figures. At the pit-mouth best coals do not average more than 12*s.* per ton; second qualities, 10*s.* 6*d.* to 11*s.*; common coals, 9*s.* to 9*s.* 6*d.*; breeze, 7*s.* 6*d.* to 8*s.*; and slack from 5*s.* and 5*s.* 6*d.* for the common sorts up to 6*s.* 6*d.* and 7*s.* per ton for the best qualities. The Manchester Iron Market on Tuesday brought together a fair attendance, and a more animated tone was reported generally. For pig iron there was a fair amount of inquiry from buyers, who have hitherto been holding back in anticipation of lower prices, but the actual business put through was not of any great weight. Makers, however, were generally indifferent about selling, and in most cases holding out for advanced rates, Lincolnshire being quoted at 49*s.* and 50*s.* for forge to 52*s.* and 53*s.* for foundry, and Derbyshire from 50*s.* and 52*s.* for the cheaper brands up to 55*s.* for the best foundry qualities less 2½ delivered. For Middlesboro' iron, some brands of which are very difficult to obtain, quotations were firm at 55*s.* 10*d.* to 56*s.* 4*d.* net cash as the minimum, and Eglinton was quoted at 58*s.* 6*d.* to 59*s.* net cash delivered. For manufactured iron there was also a decided tendency to harden up in prices, with an increased weight of business coming forward. Makers are gradually filling up their order-books and, although they are scarcely yet able to hold out for any actual advance, they are not quoting under 6*l.* 10*s.* for bars, and in some instances are indifferent about selling even at this figure. Hoops are firm at 6*l.* 15*s.*, and sheets at 8*l.* to 8*l.* 5*s.* per ton according to quality. Steel plates are rather irregular in price. Local and Scotch makers hold to 8*l.* 5*s.* for good boiler-making qualities delivered, but there are plates from other districts still to be bought at 7*l.* 17*s.* 6*d.* to 8*l.* per ton, and the business offering in the market is only small.

Barrow-in-Furness.—There is a marked improvement to note in the hematite pig-iron trade. The demand has increased on home as well as on Continental and foreign account, and there seems reason to believe the requirements of consumers of pig iron will increase as the season advances. On steel-making account there is an especially large consumption, and orders which were given out carefully a few weeks ago are now being given in greater bulk, both for prompt and forward deliveries. It is interesting to note that the firmness of makers of pig iron has been justified in the attitude of holders of warrants. The latter last week were quoted at 56*s.* 6*d.* per ton net cash, but have since improved to 58*s.* 3*d.*, and a good trade has been done at this figure. On the other hand, makers of iron are firm in their quotations of 58*s.* 6*d.* to 60*s.* per ton for parcels of mixed Bessemer numbers, net f.o.b., and they are in receipt of inquiries which, if entertained, would furnish them with work for a considerable time, but it is anticipated that prices will further improve, and makers are, therefore, not disposed to sell largely forward. Ever since the beginning of the year, when stocks of hematite stood at 380,000 tons, there has been a gradual decrease in the holdings week by week without intermission, but this week has proved the exception. Stocks have increased this week to the extent of 22 tons, but from the beginning of the year the stocks have been reduced 134,254 tons, leaving 246,290 tons still in stock. A better tone in the steel trade is reported in all its branches, with the exception, perhaps, of the rail trade, which, however, is steady. There is a fair demand for both light and heavy rails, and late quotations are maintained—5*l.* for heavy rails, 6*l.* for light rails, and 7*l.* for colliery sections, net f.o.b. There is much activity in the demand for steel shipbuilding material, and orders of considerable magnitude have been placed during the past fortnight. Other large orders are offering. Prices, which lately have been of a somewhat speculative character, are quoted at 6*l.* 10*s.* for plates, and 5*l.* 17*s.* 6*d.* for angles, net f.o.b. Steel boiler-plates are brisk at 7*l.* 15*s.* per ton. Other branches of the steel trade are busy, including tinplate bars, hoops, billets, blooms, slabs, and general heavy steel castings, and prices are steady. A much better tone is observable in the hematite iron-ore trade this week, inasmuch as not only is there more spirit in the demand, but the ore used in the district is now almost wholly of native quality, the Spanish supplies gradually getting used up. Prices are steady at 11*s.* per ton for average qualities. A steady trade is being done in spiegeleisen, and there is a good demand on local as well as on foreign account. Business is doing at the late quotation of 100*s.* per ton. There is a very steady and a very brisk business in fuel of all classes in this district, and the demand is very large and very regular. East Coast coke is quoted at 19*s.* to 21*s.* 6*d.* per ton, delivered on the West Coast. An important discovery of coal has been made at Bootle, about fourteen miles north of Barrow-in-Furness. If the find proves to be as good and as satisfactory as it has been reported, it will be of immense value to the North-west of England. Supplies of coal for Barrow and elsewhere are drawn from Barnsley and Wigan, and they represent a very dear figure. Vigorous efforts are to be made at Bootle to ascertain the actual extent of the find. It is reported that the coal is of a good quality, and that it has been found on a line running directly north and south from Whitehaven to Wigan.

North of England and Cleveland.—The Northern iron trade continues to steadily improve, and prospects for the future are regarded by those interested in the trade as highly satisfactory. Prices are advancing, and the demand all round is good. Recently some rather large contracts have been entered into, and perhaps the most satisfactory feature in the market is the inclination shown by buyers to do business ahead. For some months consumers have been unwilling to buy for forward delivery, but the outlook is so favourable now that they are somewhat anxious to purchase ahead, and inquiries for delivery to the end of the year are rather numerous. The possibility of a stoppage of work in Scotland in consequence of the blast-furnacemen demanding remuneration at the rate of time and a half for Sunday and Sunday night labour has considerably strengthened the warrant-market; and, as that really rules the price of iron, the effect has been beneficial. It is generally believed that the Scotch ironmasters will concede the demand which is enjoyed in Cleveland. If the claim is granted, the cost of production will, of course, be increased, and Scotland will not be so well able to compete with Cleveland. Several makers are asking 47*s.* 6*d.* per ton for prompt f.o.b. delivery of No. 3 G.M.B. Cleveland pig iron, but there are one or two firms who would be willing to book a good order at 47*s.* 3*d.* This quality continues very scarce, and holders are keeping what little they have in the hope of realising still better prices. Middlesborough No. 3 warrants are still in the hands of only a few people, who are able to alter the quotation slightly almost whenever they feel disposed. Cleveland warrants cannot at present be bought under 47*s.* 8*d.* cash. Cleveland No. 1 is 50*s.* The hematite pig-iron trade is rather quiet, but the price is tending upwards. Nos. 1, 2, and 3 East-Coast brands of makers' iron are 57*s.*, and there are one or two firms who ask 58*s*, and even a trifle more. Shipments this month are highly satisfactory, and there is every likelihood of them being the heaviest of any month's this year. In the finished-iron trade there is continued improvement. During the past month producers in this district have advanced their prices more rapidly than have makers in other localities, but it must be remembered that in the early part of the year they fell more than in other districts. There is a good demand, and altogether prospects are very satisfactory and encouraging. Common bars are 6*l.* per ton; ship-plates, 6*l.* 2*s.* 6*d.*; and ship-angles, 5*l.* 15*s.*, all less the customary 2½ per cent. discount for cash. The steel trade does not improve so much, but producers report a better feeling, and some of them are not so anxious to sell at market quotations as they were a little while ago. Heavy rails are 5*l.* per ton, and ship-plates 6*l.* 17*s.* 6*d.* Some departments of the fuel trade are rather easy, but, generally, 13*s.* per ton f.o.b. is the price of best Northumbrian steam coal, and about 6*s.* 6*d.* for small. Blast-furnace coke is steady, and 15*s.* to 16*s.* per ton is paid for delivery at Middlesborough.

Scotland.—The scarcity and dearness of fuel are causing anxiety both to the exporters and home consumers. The miners have been restricting the output of coal to a much greater extent than before. In some districts they have

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worked only two or three days during the past week, and it has been simply impossible for shippers to enter into any fresh engagements, while the prices have been raised to the home consumers in a way that threatens to destroy profits on production. Some of the larger iron and steel works are reduced to one or two days' supply of fuel, and the miners seem determined to push restriction to such an extent as to compel the coalmasters to advance their wages. In the pig-iron trade the main topic of interest is the demand of the blast-furnacemen for increased pay, and the resolution of the ironmasters to resist it to the utmost. The whole of the pig-iron producers of Scotland are concerned in this dispute, and the possibility, not to say probability, of all the furnaces being damped out a fortnight hence, has exercised a hardening effect on the market, and caused a substantial advance in prices of warrants. The values of the principal makers' brands are also somewhat higher. The position of the malleable-iron trade, from a producer's point of view, is highly satisfactory. Merchants are not, however, quite so well pleased with the state of matters, because they have suddenly found that makers are really unable to give them suitable delivery on orders. Within the last few days some specially good lines of general malleable work have been placed here for South Africa. Prices are firm, and tending upwards. The lowest grade of common bars is quoted at 6*l.* 7*s.* 6*d.*; second grade, 6*l.* 10*s.*; highest grade, 6*l.* 12*s.* 6*d.*; best bars being 10*s.* a ton higher; nailrods, 7*l.*; hoops, 7*l.* 5*s.*; sheets, 8*l.*, all less 5 per cent. discount. A fair amount of new work is being placed in the steel trade, although inquiries are fewer. The demand for ship-plates is active, and that for boiler-plates has become more pressing. Prices are as follow:—Steel angles, 6*l.* 5*s.*; ship-plates, 7*l.*; bars, 7*l.* 5*s.* to 7*l.* 10*s.*; boiler-plates, 7*l.* 15*s.* to 8*l.*, all less 5 per cent. discount for delivery in Glasgow district. The Glasgow pig-iron market has been firm. The week's shipments amounted to 10,879 tons, as compared with 8,400 in the same week of last year. Some of the producers of hematite pigs have given notice to the Spanish ore-merchants to stop supplies for the present, and this fact has been accepted as indicating that the smelters themselves are apprehensive that they may not succeed in settling the differences with colliers and blast-furnacemen.

THE METAL MARKETS.

Copper.—The Chili charters for the first half of this month being advised as 2,000 tons, the total supplies for that period are stated to be 5,013 tons. Deliveries over the same fortnight have only amounted to 4,486 tons, an increase in the stocks of 527 tons. This increase is not in itself of great importance, but, considering the very favourable statistics at the end of August, the present increase, small as it is, can hardly fail to emphasise the warnings which have been uttered against raising the price of G.M.B. to a consumption-checking point. The opening 'Change on Friday of last week was steady at 60*l.* 17*s.* 6*d.* cash, and 2*s.* 6*d.* more for three months, and at these levels values ruled throughout the day. Some 250 tons were realised, the bulk of which was done in the morning. The market was fairly brisk on Monday, the day's sales having reached about 900 tons, 700 of which were done in the morning. The opening business was for five weeks at 61*l.* 2*s.* 6*d.*, three months at 2*s.* 6*d.* dearer, and cash 61*l.* 2*s.* 6*d.* Before the 'Change closed all these positions had improved, and the final quotations for cash and three months were respectively 61*l.* 10*s.* to 12*s.* 6*d.* and 61*l.* 15*s.* to 17*s.* 6*d.* three months. The second 'Change was also firm, and various parcels of three-months stuff realised 61*l.* 17*s.* 6*d.* to 61*l.* 18*s.* 9*d.* Cash was not in such active request as forward, but the price stiffened and closed at 61*l.* 12*s.* 6*d.* to 15*s.*, whilst three months stood at 61*l.* 18*s.* 9*d.* to 62*l.* The publication of the Chili charters on Tuesday evidently checked any further upward movement, for in the morning the highest point touched by cash was 61*l.* 10*s.*, whilst at the close of the day it stood 2*s.* 6*d.* lower. Three months, though a trifle quieter, was fairly steady, and approximated upon 61*l.* 15*s.* all day, the fluctuating limit being confined to about 15*d.* up or down. Transactions for the day amounted to some 350 tons. On Wednesday cash was done at 61*l.* 5*s.* to 12*s.* 6*d.*, and 61*l.* 7*s.* 6*d.* for September 26. Three months ruled in the morning at 61*l.* 12*s.* 6*d.* to 15*s.*, and advanced during the second 'Change to 61*l.* 15*s.* to 62*s.* 2*s.* 6*d.* Mild and refined sorts are firm at late quotations.

Tin.—This metal has been firmer and much more active than of late, but the chief call has been on account of spot stuff, with the result that the premium on three months has not only been wiped out, but that at one time the latter was at a discount of 7*s.* 6*d.* to 10*s.* On September 12 a strong market was reported, although the total sales for the day did not exceed 120 tons. Cash and three months were together in the morning at about 98*l.*, but in the afternoon three months was cheaper than spot, the latter having advanced to 98*l.* 10*s.* to 98*l.* 12*s.* 6*d.*, whilst the former remained at about 98*l.* to 98*l.* 5*s.* Additional firmness ruled on the resumption of business on Monday morning, and the unusual feature of cash being dearer than forward was again noted. In the morning spot rose to 99*l.* to 99*l.* 2*s.* 6*d.*, and three months also advanced, but only to 98*l.* 7*s.* 6*d.* to 98*l.* 15*s.* In the afternoon there was less inquiry for both cash and forward metal, but, for September 18, 99*l.* 7*s.* 6*d.* was paid; for all November, at buyer's option, 99*l.* 15*s.*; and for November 1, 99*l.* 2*s.* 6*d.* Spot was also done at 99*l.* 5*s.* to 99*l.* 7*s.* 6*d.*; and three months nominally advanced to 98*l.* 12*s.* 6*d.* to 98*l.* 15*s.*, although business done in that direction was practically *nil.* Thursday morning's market was firm, but the afternoon 'Change was rather quiet. Yet throughout the day sales were small, the total quantity being under 100 tons. The initial prices of the day were 99*l.* 5*s.* to 99*l.* 7*s.* 6*d.* cash and end of October, and 98*l.* 15*s.* to 98*l.* 17*s.* 6*d.* three months, but on the spot price there was a decline of 5*s.* at the close of the afternoon, and three months, though not so much changed, was a shade weaker. Cash stuff ruled on Wednesday at 99*l.* 5*s.* to 12*s.* 6*d*, whilst three months still lagged behind at 98*l.* 10*s.* to 99*l.* Australian was quoted 99*l.* 7*s.* 6*d.* to 99*l.* 15*s.*

Tinplates. — *London.* — There is a marked improvement in the condition of this trade, and the prices asked are readily maintained; in fact, the makers are beginning to feel that at last they are to have their innings, and accordingly they are not in much haste to give quotations for either prompt or forward sales. *Liverpool.*—Many buyers are in the market for rather large quantities of both Bessemer and Siemens steel coke tins, mostly in special sizes. Terneplates are also more inquired for than they were. The inquiries this week both for tinplates and terneplates are chiefly for forward delivery, many of them extending into the first half of next year. An impetus has been given to the business by the number of offers made for plates for such extended delivery, and the anxiety to secure such supplies forward seems to be spreading. This is the result of the Tariff Bill debates in the States, and the strong probability of its being put into operation earlier than anticipated. What is most desired on the part of both buyers and sellers, as well as makers and merchants, is to know their fate without any further suspense. It cannot be said that the Tariff Bill is safely through or out of the wood yet, and there is great doubt and uncertainty as to when it will come into operation. Coke tins and Bessemer steel cokes now range as quoted, for from 15*s.* 3*d.* and 15*s.* 6*d.* to 15*s.* 9*d.* and 16*s.* I.C.; wasters, 14*s.* and 14*s.* 3*d.* to 14*s.* 6*d.*; Siemens-Martin steel cokes, 15*s.* 9*d.* to 16*s.* and 16*s.* 3*d.* to 16*s.* 6*d.* I.C.; charcoal tinplates, 16*s.* 6*d.* to 17*s.* and 17*s.* 6*d.*, also 18*s.* to 18*s.* 6*d.* and 19*s.* I.C.; best charcoal tins, 19*s.* 6*d.* to 20*s.* and 21*s.* to 22*s.* and 22*s.* 6*d.* I.C.; terneplates, 28*s.* to 28*s.* 6*d* and 29*s.* to 30*s.* and 31*s.* to 32*s.* and 33*s.*; wasters, 26*s.* 6*d.* to 29*s.*

Lead rules dearer, soft foreign being now quoted 13*l.* 13*s.* 9*d.* to 13*l.* 15*s.*, and English 13*l.* 15*s.* to 13*l.* 17*s.* 6*d.*

Spelter has also advanced, and is firmly held at the latest quotations—viz., 24*l.* 15*s.* to 24*l.* 17*s.* 6*d.* ordinary, and 24*l.* 17*s.* 6*d.* to 25*l.* special.

Antimony still remains at 73*l.* to 74*l.*, at which level quotations are exceptionally firm.

Quicksilver is without change from last week, second-hand parcels still ruling at about 10*l.* 6*s.*, and first hand at 10*l.* 10*s.*

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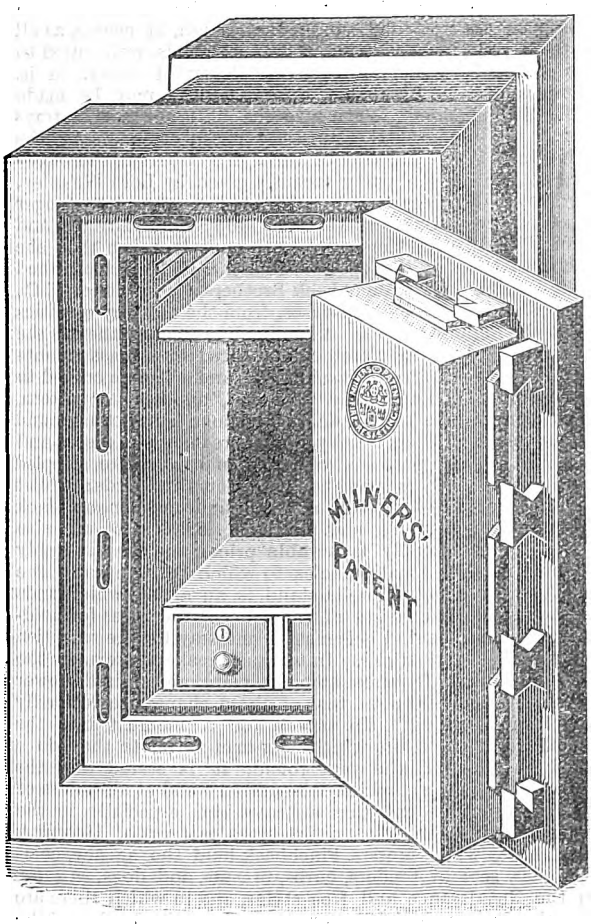
HARDWARE,

CUTLERY, TOOLS, IMPLEMENTS, AND MACHINERY.

LONDON.

General Remarks. — Taken all round, business is decidedly brisk, and the outlook is generally considered to be more encouraging than it has been for months past. The most happy feature is the steadiness of demand, a state of things, it need hardly be pointed out, which is much to be preferred to a blow-hot, blow-cold sort of trade. Of course, there are those who feel that, with the probability of early advances, buyers ought to be more enterprising, and order more freely than they are now doing; but recollections of the collapse which followed the attempt to force prices at the beginning of the present year are still fresh, and there seems to be a determination to take due heed of the old saw, "Once bitten, twice shy."

Steel and Iron Safes.—Milners Safe Company (Limited), 28 Finsbury Pavement, E.C., in order to compete with makers who offer safes at a low price, have laid themselves



out for the production of what they call their "Special" safe, which they claim to be of superior construction, and in all respects fire-resisting and gunpowder proof and fitted with an absolutely unpickable lock. In fact, with regard to this last name they state that it is of precisely the same quality as that used by them on their bankers' strong-room doors. It is made only in one size, viz., 25 inches high by 19 inches wide by 19 inches deep, but in three styles—one without fittings, a second with one drawer and a division, and a third with two drawers and no division. It is offered at a really low price and will doubtless command a ready sale, especially as it can be pretty well handled, as the weight only approximates upon 4 cwt. For the manufacture of a new patent safe which is to bear the name of the "Grip Bolt," the chief feature of which will be found in an ingeniously designed door, the firm are laying down new plant at their Liverpool works. In the top, bottom, and front edges of the door there are provided dogs or wedge-guards, so shaped that when the door is closed they pass through slots in the frame, and when the bolts are thrown by turning the lock, the wedges and bolts thoroughly grip each other, and thus afford much additional resisting power. To still further increase the gripping power, the back of the door is finished off with a semicircular-like groove which works closely into a similarly shaped groove made in the frame of the safe. The frame is made of a specially-rolled section of steel into which the body of the safe is fitted, whilst the dogs on the door are milled out of one solid piece of angle steel. This safe is to be made in all sizes, and will be throughly fire and thief resisting. The accompanying illustration shows the special grip arrangements. Their patent "Branch" bank strong hold-fast and fire-resisting safe, with solid steel bullion coffer, and their patent undrillable bankers' door with ventilating gate, are specialties for which they are experiencing a heavy call. General work is also keeping them so well employed that it is only with difficulty they are able to keep pace with their orders, and, although they could give employment to more hands, the necessary skilled labour is not forthcoming.

Electric-light Fittings, Lamps, &c.—William Soutter & Sons have on view at the London show-rooms of Mr. J. J. Smith, 47 Holborn Viaduct, a variety of their newest patterns in electric-light fittings, floor and table lamps. With regard to the electric fittings, the floral and foliated treatment which the firm introduced some little time ago has sold remarkably well, and, encouraged by the success of the departure, new, and in some instances more elaborate, designs have been prepared in wrought iron, copper, and brass. Although a few new ideas are found amongst the electroliers and pendants, the bulk of the new patterns are found amongst the wall-brackets, &c., with and without mirrors. One charming design represents a swan's neck and wings, the neck being done in copper and the wings finely wrought in black iron. Another good piece of work in a combination of metals consists of a cowslip-bracket, in which the blossom is done in iron and the leaves in wrought iron; but possibly a still finer specimen is comprised in a representation of the wild hazel-nut, in which branches, leaves and nuts are most naturally depicted in copper and brass. Electroliers and brackets, *en suite* in the Renaissance and Louis XIV. and XVI. and free classic styles are also displayed in variety. In telescopic and non-telescopic floor-lamps the wrought-iron worker's skill has been further requisitioned in many directions, and for the imitation of a number of flowers; but one specimen calls for particular mention. It embodies a rose, growing up from the base, and its branches intertwining most naturally amongst the pillars which carry the lamp. The work itself is executed in splendid style, but there is a peculiar charm in the way in which the idea has been carried out. Some engaging patterns in brass have been produced in the Roman and Grecian styles; but by way of a change from the metals commonly employed silver-plated and gilt decorations have been adopted with most happy results. Passing reference may be given to a series of lamps fitted with three small rustic or gipsy-like tables, so that the lamps may be utilised

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for purposes of afternoon tea. The same idea has also been adopted in kettles hanging on high stands. Before leaving this department it must be stated that the telescopic arrangements are now governed by a new patent spring-catch, which is simply operated, and is said to contain no parts likely to get out of order. In suspension lamps for halls, and chandeliers for either oil or gas, and in duplex table-patterns, the high-class requirements of the season's trade have been fully provided for, whilst to meet the needs of those who ask for cheaper productions the firm have turned out a series of cheap Grecian urn, vase, and other shaped table patterns. As agent for A. & R. Cochran, Glasgow, Mr. Smith is also showing an extensive assortment of plain and variously tinted glasses for electroliers, gas-chandeliers, and oil-lamps, and the collection has been arranged so that buyers can see at a glance what they require to match their other purchases. Some of the new tints are extremely pretty, and stand out in great relief to the glaring or else insipid colours which not so long ago were dubbed æsthetic. Strode & Co., Osnaburgh Street, N.W., are well employed on electric-light work, but the bulk of their engagements are on special orders. Although electric lighting is undoubtedly making great progress, it has not yet arrived at a stage at which it is considered absolutely safe to rely upon it altogether, and, therefore, combined with many of the electroliers are arrangements for gas lighting. Yet the principal feature of this combination work is to give prominence to the electrical portion and to obscure by means of ornamentation the gas taps and burners, and in this matter the firm have produced some excellent designs. At the branch establishment which was opened some months ago in Piccadilly for the special display of electric-light fittings, there is a complete lighting plant, and at the back of the showroom an apartment has been provided which can be rendered perfectly dark, for the purpose of testing the full effect of the light and the variously tinted shades. The ribbed metal which Messrs. Strode introduced some little time ago has proved highly attractive, and its use is now the rule rather than the exception. As a new departure, they are also producing high-class electroliers and other articles in mixed metals—viz., a special kind of white metal kept dull, which closely resembles German silver in appearance, and brass treated in a peculiar method so as to make it look like gilded metal or ormolu. The combination under skilled manipulation is capable of some delightful effects, and this firm at the present time have some choice work in hand. In lamps for halls or large porches there are displayed at the Osnaburgh Street showrooms some Gothic designs of the twelfth century done in black wrought iron, and others of a character which belongs to about a century and a half later. In wall-brackets there are some finely-wrought specimens, also in iron, in the French Renaissance style, and others in brass, in the Flemish Renaissance style, and amongst these latter is one very massive and valuable piece of work. For the forthcoming Arts and Crafts Exhibition the firm have in hand some elaborate work, included in which is a newell stand in wrought iron for carrying a lantern. The design, though not altogether of one particular school, may be generally described as Elizabethan. Another and more elaborate piece of work consists of a newell-post in which the most prominent feature is a Mephistophelian-like figure. The chest is enclosed in armour, and the lower parts terminate in floral characters. The head and face of the figure are *repoussé* in sheet metal, and their production has occupied some little time. The portion of the balustrade shown is in wrought iron, and decidedly Italian in style. At the exhibition the newell stand and lamp will be mounted upon the newell-post, an arrangement simply for convenience; but the two pieces of work are totally distinct, and bear no possible relation to each other. In other branches in which wrought iron is employed may be mentioned bedsteads. The sale for these is not extensive, for the sufficient reason that they are costly, and necessarily so considering the fine details of the work. They can be turned out either in dead black, or, if preferred, the floral portions can be gilded and the other parts painted in white or cream. Special work recently completed comprises a handsome screen some 24 feet wide, and a baptistry for Holy Trinity Church, Shoreditch, in which are contained some elaborate details. Reverting to more general work, it is to be noted that the development of the electric-light has not yet interfered with the "sun burner" branch of this establishment, for it is one in which the firm report themselves increasingly busy.

Coal-vases, Fenders, Fire-brasses, Trays, &c.—B. Perkins & Sons, Bermondsey, are displaying in their City show-rooms at 139 Cannon Street, E.C., a great variety of new patterns in wood and metal coal-vases. Of the former kind the leading makes for the season are the "Essex," fitted with a pedestal top; the "Sussex," also provided with a pedestal, but having in addition a mirror back; the "Osborne," the "Henley," the "Villa," and the "City." The last four are less expensive than the "Essex" or the "Sussex," and are designed to meet the needs of buyers who ask for thoroughly substantial but not elaborate articles. The whole series is done in various woods to suit the furniture of a room. In metal vases the new patterns comprise some fifty different productions, and amongst them are the "Lytton," the "Wolseley," the "Cairo," and the "Wreath," all of which, it is believed, will prove great favourites. Floral decorations, done in soft and delicate tints, are leading features of the ornamentation, and considerable effect has been produced by thoroughly artistic shading. The brass boxes have panels in various styles, all of which betoken careful work. But while these new patterns have been introduced in order to keep pace with the necessities of the times, older and well-established lines are still in good call, and, as far as can be judged, there is no immediate prospect of their being superseded. Ornamental stick and umbrella holders are likewise in fairly active demand. In tea-trays and waiters some really fine specimens of high-class work have been turned out, in which hand-painted decorations play an important part. The colours for the most part are soft and subdued, although, of course, as all tastes have to be considered, there are kinds well suited to those who love something with plenty of colour in it. *Apropos* of the high-class ware, mention may be made of a little incident relating to the "Royal" set of trays which are amongst the newest for the season. As the Princess of Wales was driving through a suburban thoroughfare to the garden party recently given by Lord Wolseley, Her Royal Highness espied in the window of an ironmonger a set of the "Royal" trays. She stopped her carriage, and desired to inspect the articles, the result being that she puchased them on the spot. Sellman & Hill have furnished their London agents, Pinchbeck Brothers, Queen Street, E.C., with a large range of coal-vases, from the ordinary qualities up to the highest grades. A leading line amongst them is the "Clarence," done in claret colour, fitted with brass mounts of registered pattern, *repoussé* hinges, and a handle curved to the shape of the hand. The "Empress," another new pattern, is not confined to one shade, but is done in various ground colours, such as French grey, moss green, apple green, and the like. Other patterns are done in carmenette, stippled with bronze; others bear cherry blossoms and birds; whilst for another range heliotrope and similar decorations on black ground form engaging combinations. Brass vases are also shown at uncommonly favourable prices, and are admirably adapted for the constituencies to which they appeal. The Portland grass and umbrella stand is an article which finds a ready sale. It consists of three decorated tubes for holding grass, and behind it is a strap and tray for the reception of umbrellas and sticks. In tea and breakfast tray sets the new decorative features embody plain and raised flower ornamentation, and not a few of these shapes are decidedly novel and striking. To travel for a moment into the metal trunk trade, in which the firm intimate they do a good business all the year round, it is stated that the "Colossus" pattern, which is bound in wood at all points of rough contact, is enjoying a heavy run, especially in the colonies. The fenders and fire-brass patterns of Hooper & Edman, for which Messrs. Pinchbeck hold the agency, comprise new sets of fenders, curbs, brasses, and dogs, *en suite*, in the Renaissance and free styles, and in which there are contained some special lines well worth the inspection of the trade. An attractive line is also shown in the shape of a companion set, including stand and four articles, all well got up and finished. As agent for Wells Brothers, Birmingham, Mr. J. Hardy Smith, 139 Cannon Street, E.C., has a variety of new patterns, some of which are done in classic and others in modern styles in brass and black and brass. In all-brass curbs there is one fine specimen in the Adams style, which

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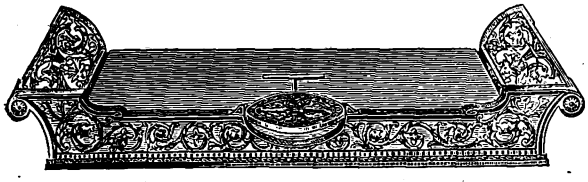
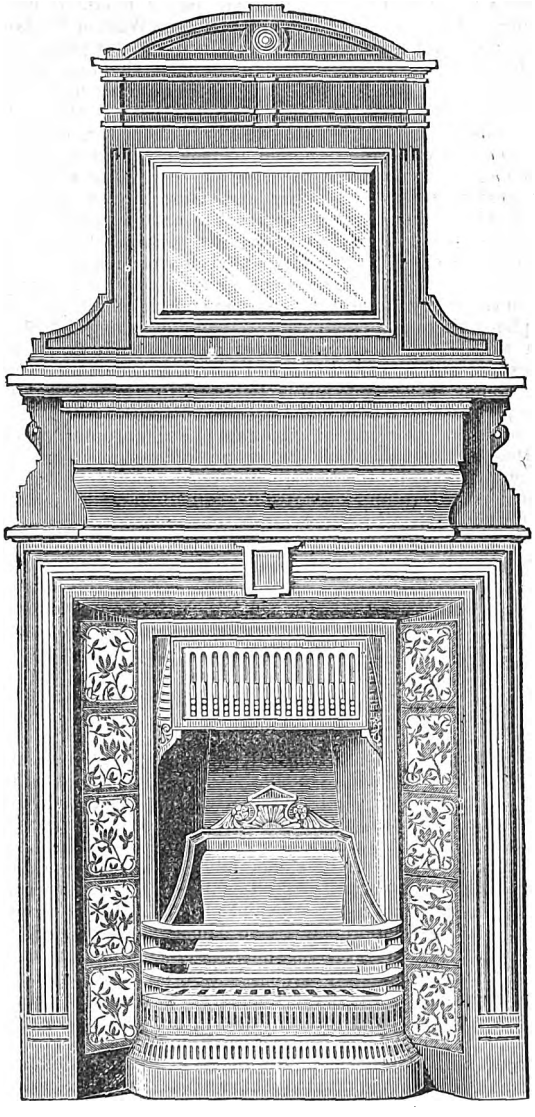
has heavy and substantial panels, yet finely cast, and the dogs and fire-brasses, of course, matching the curb. In other patterns cast-brass panels are also seen, whilst in other designs a happy combination of brass and copper comprises a leading feature. The trivet-fender which Messrs. Wells introduced a few months ago has been and still is in satisfactory demand. The accompanying illustration shows the fender with the trivet in position for resting anything upon



it, but when it is not required to be so used it can be readily raised to a vertical position. Whether vertically or horizontally placed it is rigidly held and cannot slip. The coal-boxes which W. Soutter & Son have sent to Mr. Smith's show-rooms on the Viaduct comprise patterns in steel, bronze, Florentine, and gilt, most of which are of an elaborate character. It is singular to note that, notwithstanding the development of the call for coal-vases, there is still a good demand for the old-fashioned open scoops, and, no doubt, the trade in them is kept alive by the excellent production of the leading firms. The old and severely plain styles are, perhaps, going out, and in their places are being substituted makes bearing a certain amount, but not too much, of decoration of a simple yet highly artistic order. A similar change is also being effected in jardinières and stands, of which articles Mr. Smith is showing a good variety.

Household Requisites.—Crowden & Garrod, Southwark Street, S.E., intimate that during the last few months they have experienced a good run on brushware, household enamels, knife-boards, carpet-sweepers, lemon-squeezers, spirit-stoves, unbreakable pulp tubs, and numerous sundries for domestic use. Fordham & Sons, Limited, York Road, King's Cross, find trade steady, and in expectation of it remaining good they are keeping up their stocks. At the moment they hold in Liverpool and London about 20,000 boxes of clothes-pegs, and their trade in glue is so extensive that it is always necessary to have from 100 to 200 tons on hand to meet contract requirements as well as the ordinary run of trade. Brooms and brushware are also large items in their returns, and the business of this department, as well as in general lines, indicates a growth which is very satisfactory. Brooke's Soap (monkey brand) has now become one of their staple lines, and as with Cannon's size, Gard's cloths, Percival's safety traces, and patent, unbreakable pulp-ware, the firm possess specialties which help to sell each other. For the autumn and Christmas trade there is in hand a series of articles made in the patent unbreakable pulp-ware decorated in a style especially suited to the requirements of the season. H. A. Goodall & Co., Bartlett's Buildings, E.C., report a livelier state of things all through the present quarter than during the previous one. In fancy hardware the demand has been fairly steady all through the summer. Brushes and brush-ware have shown a good return, and tools, papier-mâché trays, tinware, stove-screens, and a hundred-and-one other articles for domestic uses have all shown increased demand. S. Ramsey & Co., St. John Street, Clerkenwell, E.C., report a fairly good season in garden articles, flower-baskets, and other specialties in the wirework trade. For the autumn and winter trade the firm have made special preparations for the supply of handsomely-designed bird-cages in great variety. The prices are favourable to buyers, and as the goods have an attractive appearance the chances of a successful run upon them are considerable.

Builders' Ironmongery.—Dobbie, Forbes & Co., Larbert, report from their London office, Suffolk House, Laurence Pountney Hill, E.C., an increasing trade in their "Larbert," "Colonial," and "Victory" kitchen-ranges, and that in order to develope the convertible principle of ranges they are preparing to place on the market a new design, in which will be adopted a new and ready method for making the fire either open or closed. For the ensuing season they are also busily engaged in the preparation of some new patterns in heating-stoves of the slow or semi-slow combustion order, in which one or two novel features will be embodied. In Berlin-black registers they have been and still are busily occupied, and arrangements have been made for extending their operations in that direction, with the view of offering really good work at attractive prices. Metal mantel and over-mantel registers have likewise been engaging their attention for some little time, and they are now ready with



some half-dozen new patterns in mantel registers, three of which are of simple design, whilst the remaining three are more or less ornate. In each case the intention has been to closely imitate wood, and the fineness of the lines produced, as will be seen, though somewhat inadequately, from the accompanying engraving, the effort has been successful. They are sent out with one coat of paint, so that a builder may finish them in a style in keeping with the decorative features of the rooms in which they are placed, although, if preferred, they can be finished in oak or walnut. The sizes of the several portions are as follows:—Fire-box, 16 inches; mantel, 36 inches wide by 51 inches high; over-mantel, 25 inches high, and the mirror (fitted with bevelled edges), 16 inches wide and 10 inches high. It will thus be seen that the mirror is placed in a convenient position to allow a man of average height to use it for shaving or dressing. Each mantel has double shelves, and the grate is made with a lift-off canopy to facilitate the sweeping of the chimney, hook-on bars, and a semi-slow combustion fret or pan.

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Miscellaneous.—The Automatic Tap Syndicate (Limited), 11 Queen Victoria Street, E.C., intimate that, although their patent tap, which is constructed to Rigg's patent, has been upon the market only a comparatively short time, it has made progress entirely beyond their expectations, and already the demand for it is greater than their present productive capacity. Its adoption has proved highly effective for draw-off, lavatory, and through-way purposes in many places where hitherto much difficulty has been experienced in providing a tap strong enough, and yet easily operated under exceptional pressures. In one village in the West of England, where a general water-supply is obtained under a pressure of 110 lbs. per square inch, it was found that the best of the ordinary taps which had been tried were not only difficult to work, but also that the water rushed out of them at a dangerous force. The automatic tap, however, has been found equal to the occasion, and, as it is operated by a lever, the villagers are now able to draw off the water with ease and perfect safety. Further and more severe tests are certified by eminent water engineers to have resulted in the tap withstanding a pressure of 400 lbs. per square inch, and the closing entirely unaccompanied by concussion. This last-named is due to the automatic character of the design, and to the following action. In the spindle which operates the piston there is a small central passage, along which as soon as the tap is opened water automatically flows, and passes into and fills what is called a cataract chamber. There is, of course, another chamber between the piston and the main pipe, through which the greater volume of water flows and finds its way out of the tap. For purposes of distinction let this be called the supply chamber. When the pressure exerted by the hand of the person opening the tap is removed the volume of water in the supply chamber being greater than that in the cataract chamber gradually overcomes the force stored up in the latter, and thus the tap closes slowly, but without waste of water. There is only one small spiral spring used in the tap, and all the duty it performs is to close the tap when the head of water is purely nominal. The value of the invention is being demonstrated by large repeat orders, and by a good European demand.

BIRMINGHAM.

Machinery and Engineering.—The engineers and machinists of the Midlands are obtaining their full share of the large business which is stirring in this branch; and in Birmingham as well as the Black Country full time appears to be the rule, both in tool-shops and constructive works. The makers of certain specialties complain of the dulness of demand; but, in the majority of cases, they are running overtime and extending their works and plant. A large proportion of the business in hand is on home account, and the demand is especially active for shafting, stamping, and tube-drawing machinery. Gun-making lathes and rifling-machines are in request for the Government as well as for private contractors; and stamping and drawing presses for cartridge and shell making are also being turned out in large quantities for local ammunition manufacturers, most of whom are making important additions to their works. The Birmingham Small Arms Company's expenditure this year on rifle and ammunition machinery is estimated at over 50,000*l.*, and Kynoch & Co.'s productive power is reported to be nearly double what it was a year ago, principally owing to the acquisition of new works at Hockley, and the abandonment of the unprofitable lamp branch, which formerly occupied so much valuable space at Witton. The Government arsenal at Sparkbrook is also making large additions to its plant and machinery. Cycle-making machinery has been in especial request for Birmingham and Wolverhampton, as well as Coventry makers, and lathes and presses suited for this class of work can hardly be produced fast enough. Some of the mill-roll makers are very busy on linoleum rolls and flour-mill work both for home and export. Electric-light apparatus and dynamos, both for house and ship lighting, command a brisk inquiry; and the demand for railway-bridge work and roofing for India, Australia, and parts of South America is still very large. Lifting and screwing tackle also is in brisk request for the same markets. There is not so much doing in naval machinery, but the makers of large marine engines are well employed, and there is no lack of orders for torpedo-machinery, air-compressors, &c. In these branches G. E. Bellis & Co. are fairly busy, and the firm have good orders in hand for electric-lighting appliances for the navy. Tangyes (Limited) have been well occupied in their several specialties. Their pulley-blocks, improved sight-feed lubricators and cherry brake-blocks, and their registered house-pumps continue to meet with a large demand for home and export. J. Watt & Co. are engaged chiefly on marine engines and other heavy work. J. Archdale & Co., who have lately doubled their productive power, are fully employed on rolling, planing, shaping, and hoisting machinery for the Government arsenals at Enfield and Sparkbrook, the Birmingham Small Arms Company, and G. Kynoch & Co., and they have just opened a foundry in Ladywood for the supply of their heavy castings, for which they have hitherto had to depend on outside assistance. In the case of this firm, the orders in hand and in prospect assure steady employment for some years to come. The Patent Shaft and Axletree Company (Limited) have large orders in hand for steel bridge-work for India and South America, as well as for heavy machine-castings, and all kinds of rolled and hammered iron and steel. The Horseley Company are very busy on similar lines, an important addition to their railway engagements having lately been made by the assignment to them of two valuable contracts for station-work at Birmingham for the Midland Railway Company, amounting in the aggregate to many thousand tons of iron. E. C. & J. Keay report abundant employment at their Darlaston works, chiefly on shedding, markets, and warehouses for South Africa and South America. T. Piggott & Co., who make a specialty of light wrought-steel tubes of large diameter for water-supply in mountainous districts, have also been fairly busy in gas-holder and roofing work, sugar-machinery, saltpetre-pans, boilers, &c., for the leading foreign and colonial markets. Mr. T. Chatwin reports business active in stocks, dies, tube-cutters, and gasfitting tools of every kind, a large proportion of the orders being for foreign and colonial markets. Blaiberg & Marson, who have been working overtime for several months past, and are extending their works, report great activity in similar lines, as well as in screwing-tackle and special machines of various kinds, which are in request for the Australian, as well as the Indian and South American markets. Taunton, Delmard, Lane & Co. (Limited) continue busy on Government orders for air-compressing machinery, hydrogen balloons for military purposes, dynamite-shell ejectors and torpedoes, as well as all kinds of iron and steel tubes. Heenan & Froude are busy on torpedoes of a novel and ingenious character, as well as blowers. C. Winn & Co., who are making important additions to their machinery department, report an active demand for all kinds of force pumps, boiler-fittings, twist-drills, screwing and drilling machines. Planishing-hammers are in good request with W. & J. Player; wire-working, chain-making, and pin-making machinery with Mr. E. S. Bond; drawing-presses, condensers, and plummer-blocks with Taylor & Challin; hydraulic and lifting machinery with Mr. Rowland Priest; horizontal engines and lathes with Vernon & Guest; fan and other blowers with Alldays & Onions (Limited); and general machinery and ironfoundry with Causer & Co.

Cultivating and Edge Tools.—The lull apparent in the early part of the summer has since given place to a fair amount of activity, at all events with firms who do an Eastern and Australian trade. Wedge-axes have been in exceptionally large demand, and the makers of these tools in many cases have scarcely been able to keep pace with the orders, although the United States axe-makers still enjoy a virtual monopoly of the Australian trade, and are keen competitors in the South and Central American markets. Our own colonists, it seems, are more prejudiced against English edge-tools than the axe-users of any other country, and though the English axe is fast superseding the American article in South America, the West Indies, and all the great Eastern markets, it is received with continued distrust and coldness in Australia and New Zealand. A. W. Wills & Son report that they are still very busy in all branches on tools of superior quality. In very cheap lines they say they have ceased to compete. Their orders are for nearly all the principal foreign and colonial markets, a large proportion of them being for hoes. John Yates & Co. report business good in axes and hoes for Eastern and South African markets, but their River Plate and Central American trade is still suffering from recent

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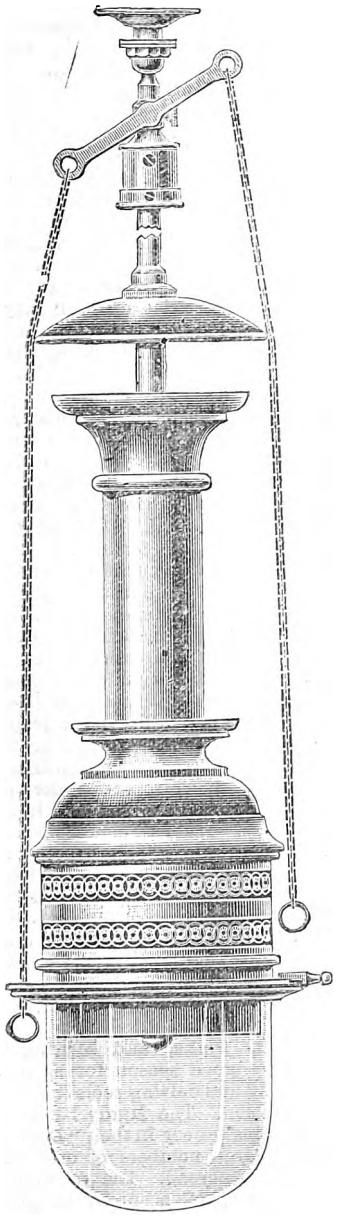
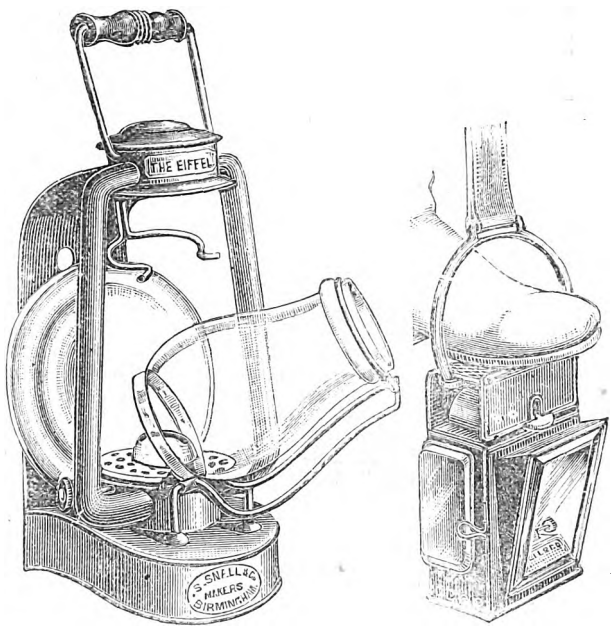
political disturbances. Mr. W. A. Lyndon is moderately busy on tools of the best class and steel-faced spades and shovels, for which a large demand is experienced in Australia. Mr. Richard Thomas has been at nearly full production through the summer on best axes, steel picks, and adzes for South American and colonial markets, and he is doing well also in road-making tools, augers, &c. Matchets of the better class are in request with Mr. Mole; spades, forks, and shovels with A. & F. Parkes (Limited); trowels and general tools with the Brades Company; and hoes, spades, and picks with G. Thornton & Co.

A Regenerative Gas-lamp.—John Wright & Co., Essex Works, Thimblemill Lane, Birmingham, are bringing out a new regenerative lamp of the pattern here shown. The lamp is very simple in construction—the whole of the body being cast in one piece—and there are no tubes to get choked, as



is the case with some lamps of this description. From tests which have been carried out with the new lamp at the Birmingham gas-office, most excellent results have been attained, and the makers therefore confidently recommend it to the attention of the trade.

Lamps and Lanterns.—Snell & Co., Skinner Lane, have just brought out a new pattern combined hurricane lantern and back-lamp, termed the "Eiffel," of which we give an illustration. A dash-iron, it will be noticed, is fitted at the back for use on carts and waggons. This lantern is a most convenient article for country and colonial uses, and the manufacturers are already in receipt of good orders for it for export. Snell & Co. have also recently improved their unique ball-joint safety cycle-lamp. The appearance of the lamp is rendered more sightly by the shortening of the spring. The back-steel, or spring-protector, is firmly riveted



on, and the reflector is made loose to cover the whole of the lamp, thus rendering the article one of the best of its kind yet placed on the market. The stirrup-lamp, here shown, is of new design and admirably adapted for throwing the light well in front of the rider. This, like the "Eiffel" lantern, is finding an excellent market in the colonies. As an accessory to the lamp trade, Snell's "Comet" burning-oil for cycle-lamps is in growing request by wheelmen, owing to its brilliant and smokeless burning qualities. The same firm's rust preventive composition, for use on plated or bright parts of cycles and other metal goods, is also deserving of mention. Both the last-named materials are put up in convenient-sized bottles and tins attractively labelled, so that ironmongers will find them handy to stock and easy to sell.

Steel Toys, Hammers, Wrenches, &c.—There has been a decided recovery in this branch since the spring, and makers generally are able to report full employment, at all events as regards hammers, pincers, coach-wrenches, and shoemaking tools. Owing to the severity of German competition in the cheap lines, in which English makers are undersold more than 50 per cent., local manufacturers are devoting themselves almost entirely to tools of the medium and better qualities, for which there is, fortunately, a good demand on the Continent as well as in this country. The great advances in wages, fuel, and metal necessitated, of course, a corresponding rise in prices of finished goods, and this movement doubtless contributed to check buying until old stocks were exhausted. Fortunately, manufacturers are now working amicably and honourably together, and the trade is not being sacrificed as it was a few years ago by reckless underselling. The lull in the South African market shows signs of passing, and orders for coach-wrenches, spanners, hammers, and mining appliances are now coming in pretty freely from Natal and the Transvaal. Australia, India, and South America are taking good quantities of nail-pullers and steel hammers. Stamped quoits are in request for the Colonies, and shoemaking tools find a market even in the United States. Government orders for dockyard tools are of moderate value, and are scattered among a number of small manufacturers. The railway and tramway companies

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are good customers for ticket-nippers, as well as wrenches, spanners, and gauge-plates. In connection with the cycle trade there is still a tolerably brisk demand for spanners, most of which are produced by the stamping process, and engineers and machinists of all classes are good customers for gauge-plates. Both cycle-stampings and cycle-tools are still in good request with Wynn, Timmins & Co., who are also busy in arrow and other railing heads, stamped quoits, box-opening levers, and nail-pullers. Kimberley & Co. are busy in planes, nippers, toilet-clippers, pliers, and wrenches. G. F. Hipkins & Son report good employment on Government and railway work, and they are also doing well on account of Australia and various Continental markets. Handley & Wilkins are doing a large business in hand-forged tools, and an excellent report is made by Ross & Co., who are largely dependent on factors' and merchants' orders. Coney & Co.'s "Magic" toasting-fork, their new table call-bell with clock-work action, button-hooks, hoof-picks, can-openers, &c., are in good request, and the key-rings, nut-cracks, and champagne and other corkscrews of Mr. C. J. Willetts are also selling well.

SHEFFIELD.

Dressing-cases, Cutlery, and Plate-cabinets.—Mr. James Dewsnap is finding the Christmas trade beginning this year a full month earlier than usual, and consequently the extensive works in St. Thomas Street are in full swing. Since last season many useful novelties have been introduced. The cutlery case department has been, and is, extremely busy. One of the newest things is a patent razor-strop (fig. 1), which, from its superior mountings, is popularly called "The Cavalry." It is really an improvement on the belt-strap, and has the advantage of a case which protects the stropping part from dust when not in use. The cover or case is made so that it can be removed from either end. It has already had a remarkable success, orders coming in by every post. Quite recently one of the largest razor-strop orders ever placed by Government has been completed. In the fancy-leather department the firm are introducing several novelties in scent and handkerchief-cases. One of these leathers is of an entirely new shade of colour, which is being extensively ordered. Another design in scents is manufactured in ebony, oak, and other beautifully-polished woods, and fitted with three and more elegantly cut bottles. There is still a large demand for goods in crocodile and other fancy leathers, and plush in great variety of colour is more than holding its own in the market. The Wortley Standard cabinet continues to be popular in the market. The firm have now brought out, as illustrated in fig 2, what they consider to be an improved pattern. Both are selling extremely well. A ladies' plush workcase, of beautiful finish and elegant pattern, and stocked with best fittings, is meeting with success. A design in needle-cases is also noteworthy for its neat shape and general useful "get-up." Ladies and gentlemen's card-cases are in great demand. In combination articles I may refer to one manufactured in terra-cotta plush, for jewellery, glove, and handkerchief cases, with inlaid bevelled mirror, and altogether most handsomely fitted. Smith & Edley continue to do a very excellent business, repeats being a noteworthy feature. One of their leading departments is the manufacture of ladies' companions, the fittings of which are made by the firm themselves. One of their specialties is the newly-registered "Butterfly" case (fig. 3). It is at present selling well at a high price, but the same patterns in cheaper material will soon be placed on the market. A fan-shaped article on the same lines is also in request, and work-boxes are going off well. The ladies' "Etui" case (fig. 4), fitted up with a variety of useful high-class articles, is popular. Orders from Scotland are coming in. Dewsnap & Co., Howard Street, are experiencing a great demand for ladies' companions, which are this year worked up in most elaborate and elegant styles in seventy or eighty different patterns. Cabinets for tea-sets, lined prettily with various-coloured plushes and satins, are now also much in vogue. One of this class, recently made to order, is fitted with a complete set of hand-painted china tea-service. Stationery cases in various leathers are very much used; and shaving-cases, of new design, and compact to perfection, in all sorts of leather, are selling well. Goods made up in pig-skin are very fashionable. Dressing-cases are likely to be much sought after. Mr. Frank H. Peace is doing a large business at his Eldon Street works, which he has had to alter and extend from time to time to meet the growing pressure on various departments. So much, indeed, has the business developed during the past twelve months that further additions to workshop accommodation are again imperatively necessary, and will need to be carried out before long. Tourists' cases, dressing-cases, dressing-bags, work-cases, ladies and getlemen's companions, razor-strops, stationary cabinets, jewellery-cases, and a variety of other goods are designed in the newest styles and manufactured out of the best materials. Goods, for instance, in crocodile, lizard, and other expensive skins, are mounted with solid silver, and are especially appreciated in the London market. In ladies' work-cases one of the newest designs is shown in the illustrations (figs. 5 and 6), closed and open. This charming article is covered in roan, russia, crocodile, lizard, or pig-skin, with superior fittings and general "get-up" irreproachable in neatness and handiness. This "companion" is being ordered in large quantities. The "Eldon" writing-case, registered design, affords another instance of the attention which is paid by Mr. Peace to matters of durability, compactness, and convenience as well as to general appearance. The "Westbourne" dressing-case (fig. 7) is having a good run in various markets. Thoroughly well-fitted up, its adaptability to the purposes for which such goods are required is sure to make it more popular the more it comes under the eye of the public. In ladies' cutlery-companions (all containing Sheffield-made cutlery) Mr. Peace manufactures goods in large variety of pattern, many of which are of extremely elegant make. Amongst miscellaneous articles mention may be made of razor-strops (the ivory-handled specimens being exceptionally noteworthy), needle-cases, and silver-gilt standard goods. For weeks past overtime has been worked, and orders are pouring in from all sides. Mr. Figorski is manufacturing some useful and elegant patterns in dressing-cases for the season. His razor-cases and strops have long had a good hold on the market, and this year's goods in that line appear to be even superior to former efforts. Fancy goods, leathered in crocodile, lizard, and imitations of both, expensive and otherwise, have sold well. Edward Greaves & Son are exceedingly busy on cases for silver, electro-plate, and cutlery goods. From April to the end of June, owing to the stagnation in the silver trade in consequence of the plate duty abolition proposals, few cases for silver goods were made, and, as a large proportion of Messrs. Greaves' business is in the manufacture of these cases, work in that department was slack. A greater demand than ever is springing up for new colours in satin linings. Orders are to hand from Canada; but there is a falling-off in respect to Buenos Ayres, with which market, until lately, a good business was done. The "Portland" dessert-cases continues to be much asked for. Mr. G. T. Spurr reports orders are numerous. There is a run on cases for general table-cutlery and cabinets of all kinds. Ladies' companions are in good request. Mr. R. Smithson is experiencing a satisfactory business in razor-strops, cutlery-cases, and canteens. The demand for carver-cases has lately been better than usual. Mr. C. Kirby is well employed on cabinet-cases for silver, electro-plate, and cutlery. Blenkhorne & Co. are doing a fairly good trade in packing-cases. One or two pretty large "inspection" orders are in hand, and cases for heavier classes of goods are in considerable request.

Spades, Shovels, Picks, and Mining Tools.—Ward & Payne anticipate a good season for spades, shovels, and forks. In all digging and delving tools this firm are keeping up their high reputation. The Hardy Patent Pick Company (Limited) are exceedingly busy in their "Devil" disintegrator department, having large numbers of orders on hand, both for this country and abroad. The machine, as we have previously pointed out, is a first-rate grinder of coal, india-rubber, marl, dry soap, cork, horns, hoofs, Indian corn, and very many other materials. The firm are also extremely well employed in their boring-machine department. Large numbers are being sent out daily to various parts of the world. The "Elliott," which is the best of the several patterns the firm makes, will bore any material capable of being penetrated by a rotary steel drill. Their multiple-wedge is also in great demand for ripping down coal. The

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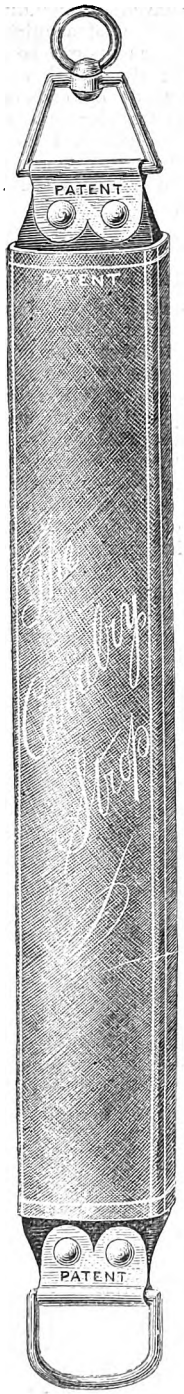

FIG. 1.

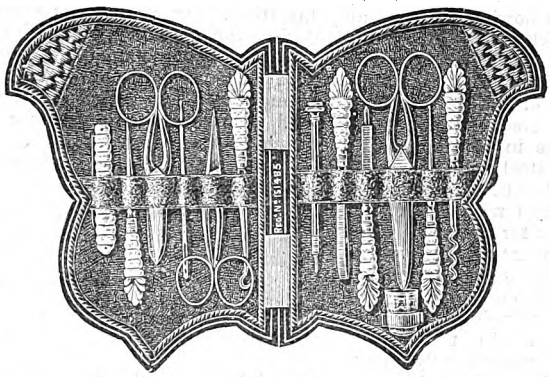

FIG. 3.

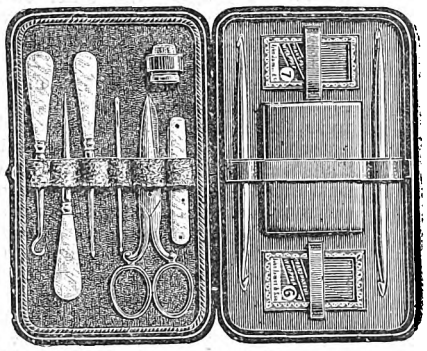

FIG. 4.

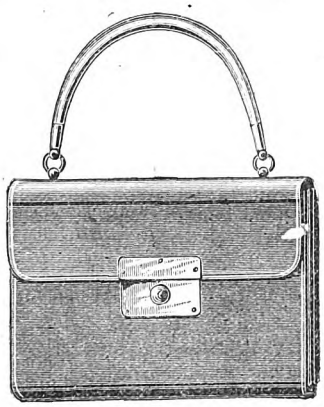

FIG. 5.

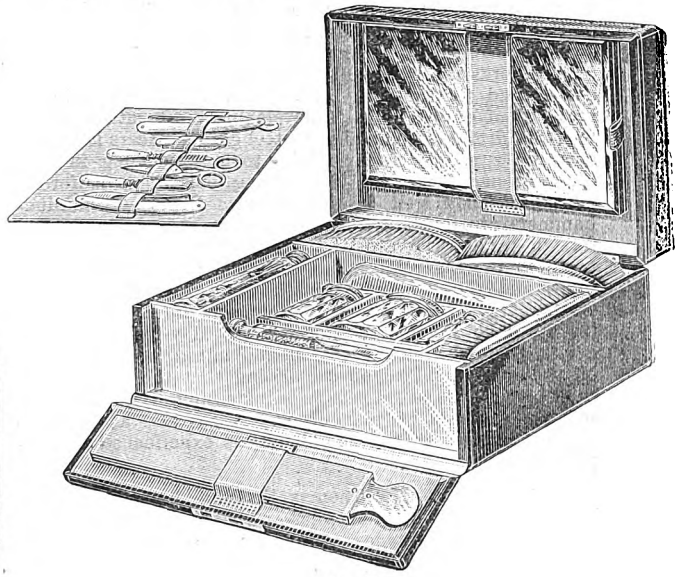

FIG. 7.

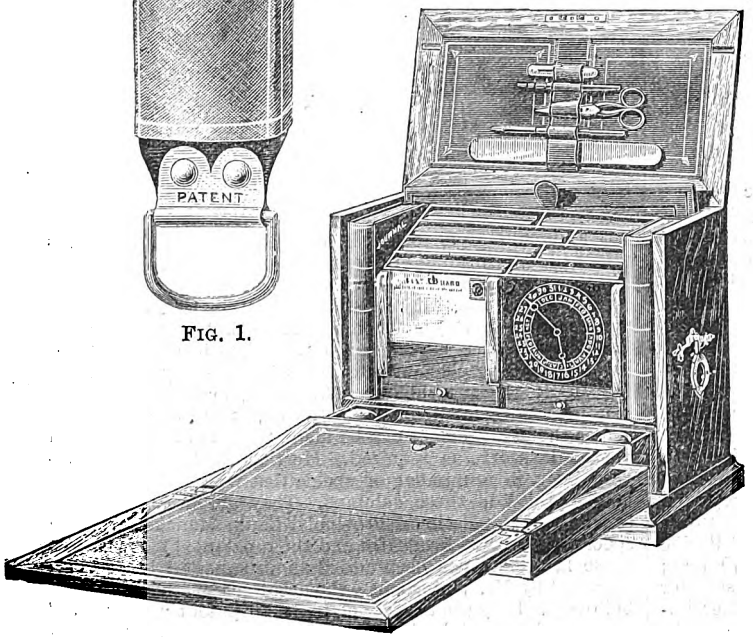

FIG. 2.

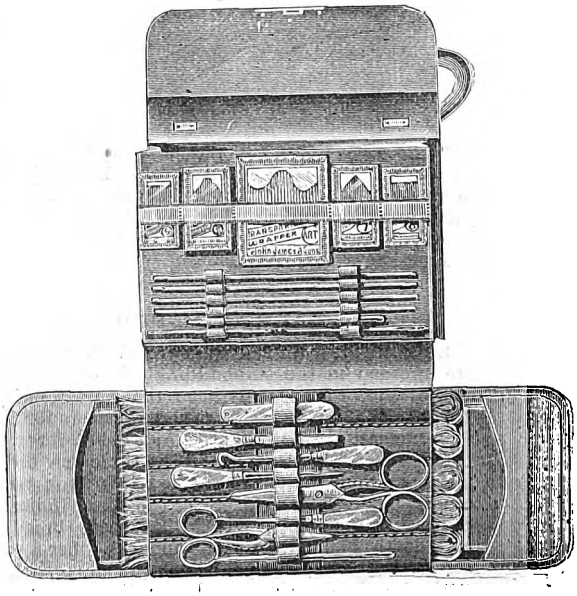

FIG. 6.

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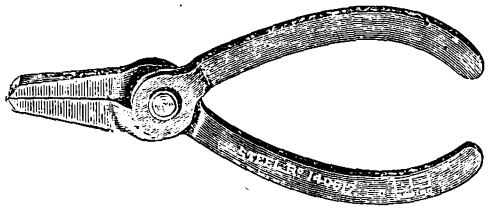
patent self-lubricating pedestal department is kept busily engaged on repeat and other orders flowing in from all sides. This ingenious little patent, which is used principally for colliery-tubs, is so constructed that it will run from two to three months in the most dusty mine with once oiling. It can be made for either outside or inside bearings. Shovels and forks are being largely ordered, especially coke forks. A good business is being done in this company's patent mineral and Acme picks—solid steel, solid eye-picks. The manufacture of hoes has only recently been commenced, but already that department is thronged with orders. In point of fact the company are so pushed for time and space that they have been compelled to again extend their works and plant considerably. Edward Lucas & Son, Dronfield Forge, are well employed on their "Ace" shovels and spades. Spear & Jackson do a regular trade all the year round in spades, shovels, and forks. In the earlier part of the year the demand was exceptionally great. Manure-forks—a speciality with this firm—are being sent out in very large quantities. C. T. Skelton & Co. are doing a larger trade than ever in spades, shovels, and hay and manure-forks. There is still a good demand for the iron and steel combination-shovel, and although the season for spades is over, fair orders are coming in. Digging and manure-forks are in request every week, and coal- and coke-shovels and forks are in brisk demand. The trade in all varieties of garden tools is developing most satisfactorily, and this firm's special make of steel garden-shears is having a capital run. Orders for mining tools are coming in from the Cape and Australia. For mining tools John Bedford & Sons are fairly well off for orders. Drills and mining-hammers are much in request, both as regards home and foreign trade. Burys & Co. (Limited) are doing a regular trade in their special make of picks and other mining-tools, and the demand is brisk for spades and shovels. F. G. Pearson & Co. state that the season orders for manure-forks are both numerous and bulky. Hay-forks formed a capital trade during the season, and mining tools are going off well. Messrs. Pearson are finding that the demand for their best classes of edge tools is increasing, particularly for superior qaulities of plane-irons. Adzes and axes are so much in request that some difficulty is experienced in completing orders.

A New Plier.—Mr. Thomas E. Ellin, Trafalgar Street, has just brought out a new plier—good as well as cheap. It claims many advantages over other low-priced pliers. It is made of steel throughout, with hardened and tempered



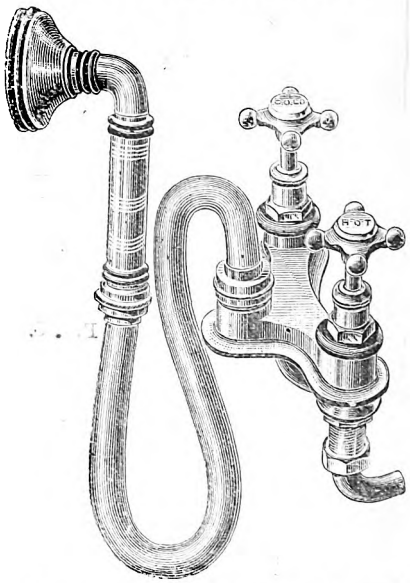
jaws, is very strong in the joint, and has ample bearing surfaces to keep it up to its work. If the joint gets loose with wear, it can be tightened again with a hammer. The pliers are light and clean in appearance, and are packed in one-dozen card-boxes, so as to make them very handy for the retailer.

BARROW-IN-FURNESS.

Shipbuilding and Engineering.—Very bright prospects are afforded in the shipbuilding and engineering trades of this district, for not only have the Naval Construction and Armaments Company in hand three cruisers for Her Majesty's Government, three high-speed steamers for the Canadian Pacific Railway Company, and the three new orders reported last week, but they have secured this week two additional orders—one for a steamer for the West Indian and Pacific Steamship Company: length, 318 feet; breadth, 40 feet; and depth of hold, 24 feet—and the other a small steamer for Messrs. Elder, Dempster & Co., of Liverpool. Other important orders are expected. In the meantime the works are very busily employed, and are likely to remain so for a considerable time to come. Gilchrist & Co., engineers, Liverpool, have visited the Whitehaven Shipbuilding Yard during the past few days, with a view of acquiring it on lease. It is contemplated, if arrangements can be made, to hold ships at Whitehaven, and fit them with engines at Liverpool. Every effort is being made by owners of the yard at Whitehaven to secure its transfer to a company which is likely to work it successfully, and it is believed Gilchrist & Co. will see their way to take over the concern. They are sanguine that if they can agree to the terms of transfer they can get plenty of orders.

LANCASHIRE.

Improvements in Sanitary - fittings. — Morrison & Ingram, Cornbrook, sanitary engineers, have introduced several improvements in sanitary-fittings. One of these is their "Victoria" bath, which is specially designed to dispense with any woodwork fitting; but, while it is adaptable for the centre of a bath-room, its special form of construction has been found inconvenient for fixing the bath alongside a wall or in corner spaces, and an improvement has been effected by altering the shape of the casting, adding a skirting round the end and near side, all cast in one piece, so that in a confined situation it fits close up to the wall and corner, and prevents wet and dirt getting down behind, whilst the space at the circular head is ingeniously utilised by providing a commodious soap-basin or sponge-receptacle. The improved design of the "Victoria" bath is that the whole arrangement is in iron, and dispenses altogether with any woodwork finishing. Another improvement in lavatory-fittings, of which we give an illustration, is a combination of



hot and cold taps, to which a flexible tube, with spray, is attached, thus forming a convenient hand-shower for baths and lavatories which are not fitted with the ordinary spray-bath arrangement. As will be seen, this combination of the hot and cold taps is very much the same as that adopted for the fixed spray-baths, with the exception that it has an outlet into the tube, in place of into the ordinary spray fixture, and the supply of either hot or cold water, or both combined, can be readily controlled as desired, whilst in small bath-rooms the arrangement can be made to serve either the bath or the lavatory, as required. Morrison & Ingram are also very busy in a number of specialties, which have already been noticed in these columns. They are fitting the new premises of the National Provincial Bank, Manchester, with specially-designed lavatories and their patent D bowls. To these lavatories has been added an ornamental brass front, designed by Mr. Waterhouse, the architect of the new bank buildings. They are also supplying their patent "Argentine" closets, with special self-lifting seats, and manufactured in the new "celladon" tints. The new Western Club at

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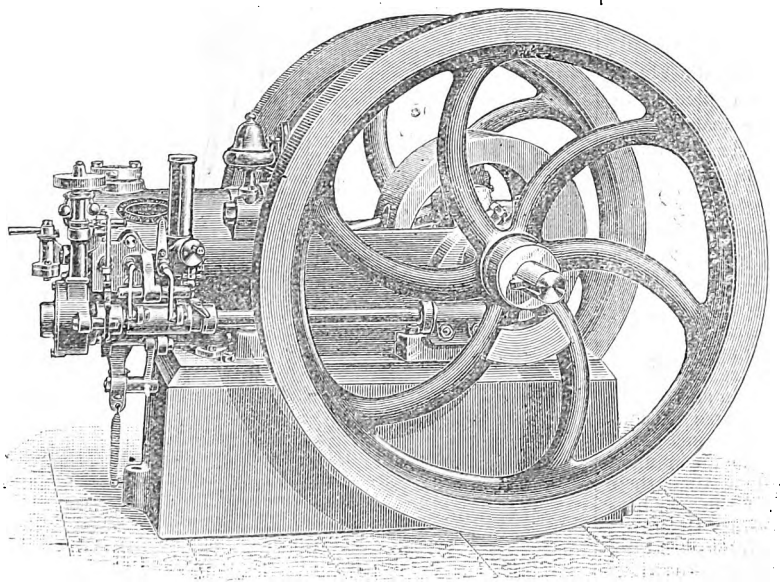
Glasgow is also to be furnished with their patent lavatory system. In their registered combination "Hygeia" sinks they are executing a considerable number of orders, these sinks possessing the important sanitary merit of being fitted complete without wood enclosure, and so arranged that any objectionable accumulation cannot remain out of sight undetected, the construction throughout admitting of easy inspection and periodical cleansing. They are also very busy in their patented fireclay pantry-sinks, manufactured in one piece, with fluted draining-shelves, white enamelled inside, and buff-glazed outside. Further improvements are being introduced by the firm in closet-cistern flushing-pipes, and in closets, which will be fitted with new flushing actions and other arrangements that are quite a new departure in many of the theories in vogue as regards this class of sanitary fitting.

New High-speed "Otto" Gas-engine for Electric Lighting.—Crossley Brothers (Limited), Openshaw, have just brought out a special engine for electric lighting. This engine runs at 250 revolutions, and has been specially designed throughout to run at this exceptional speed. It is fitted with Crossley's tube ignition, patent timing-valve, special electric-light governor, and various other improvements, specially with a view to steady running. With this



engine electric-light lamps can be driven direct from the dynamo without fitting the latter with a flywheel or disc, as has hitherto been the practice when a small gas-engine or steam-engine has been used; and the makers claim that by so working the light will be as steady as with any form of motive-power. "Otto" gas-engines for electric work are daily growing in favour and repute, and at the present time Crossley Brothers are busily engaged on orders for motors for this purpose.

Providence Foundry, Manchester.—Mr. Richard Rowbotham, Providence Foundry, Ancoats, Manchester, is completing a considerable extension of his works, which has been absolutely necessary to meet the rapid expansion of his business in all kinds of fenders, ashpans, top-bars, trivets, coal-savers, and other fireside furniture. To meet the growing trade he decided to at once double the size of his works, and the various extensions include the erection of show-rooms and stores along the frontage to the street, and an arrangement of workshops running parallel with the main foundry in the rear, leaving between the two ranges of workshops an uncovered yard, the whole of the buildings now occupying about 4,000 square yards, and forming one of the largest and best equipped foundries in the district for the manufacture of the class of goods which Mr. Rowbotham has made his specialty. The addition of a spacious show-room to the front is being made a special feature in the new works, as here are to be shown samples of every article manufactured by Mr. Rowbotham, so that his customers may have an opportunity of making a ready selection from the actual goods. The other departments include the addition of commodious packing-warehouses, both on the ground and upper floors; additional fitting-shops, which are supplied with special tools for finishing off the various descriptions of castings, such as ash-pans, fenders, &c. A new japanning-shop, with two stoves, and other workshops required for finishing in different stages the various descriptions of goods. On the ground-floor an extension of the foundry is being provided, and additional engine-power for the increased plant that has now been put down. A number of new designs and patterns in fenders are being introduced for the ensuing season in beaded steel supports and rounded ends in all classes of goods, from the cheaper cottage furniture up to the higher-class curbs for drawing and dining room fittings, whilst, as regards the prevailing fashion in the finish of the fenders, this still runs pretty equally upon steel and brass mounts. One of the most recent novelties is a patent sliding curb for tiled hearths, so arranged that it can be readily adapted to meet the various sizes of any ordinary description of fire-grates—an advantage which will be appreciated by users in removing from one house to another. This slide is very simply arranged in telescopic fashion, and when the curb has been extended or reduced in length to meet the required size of hearth it is readily secured in position by means of thumb-screws underneath the casting. In the smaller class of castings for cottage and mantel-piece ornaments the firm have introduced two small bronze figures representing Henry M. Stanley and Major Bartellott. These are got up in coloured bronze, and are both excellent portraits of the above eminent travellers, forming cheap but elegant ornaments of their class.

Brookes & Co., Cateaton Street, Manchester.—The above concern is well known throughout the trade, having, under different names, been in existence for the last 125 years, and under the present management, into whose hands the business passed a couple of years ago, considerably increased energy and enterprise have been infused into the firm. Brookes & Co. are large makers of riddles and sieves, wire bins (with or without doors to lock up), galvanised window-grates, all kinds of garden wirework, and, in fact, almost every description of manufactured goods in wire and iron, together with the one-thousand-and-one things connected with the useful and ornamental wire and iron trade. In their weaving-room they are doing excellent work, having rebuilt all their looms and added suitable new plant, one being a power-loom. In their smithy they have also put down new plant, and now make wrought-iron fencing of all kinds; also ornamental gates and railing. In their last-named branch they have recently patented a design in gate-bolts, which has proved a successful and very valuable adjunct. A new pattern of house-gate has also been a marked success, and of this alone they have supplied some hundreds of gates, which have all been delivered during the last month or two. In the heavier class of work of the same description they have recently completed a pair of gates weighing 3 tons, which may be taken as an illustration of the very wide range they cover in this description of finished ironwork, and we understand that other patents in this line have just been secured, to which we may refer on some subsequent occasion. In their lighter class of work they are producing a number of very neat and attractive designs in birdcages at remarkably low prices, and they expect that soon they will secure a large shipping trade in this class of goods.

C. C. Dunkerly & Co, Manchester.—The above firm of iron and steel merchants, which has been in existence, although under different names, from the early part of the present century, and is, perhaps, the oldest iron-merchant's business in the North of England, have just made further additions to their warehouses, which are now amongst the largest of their kind outside of London. One special object

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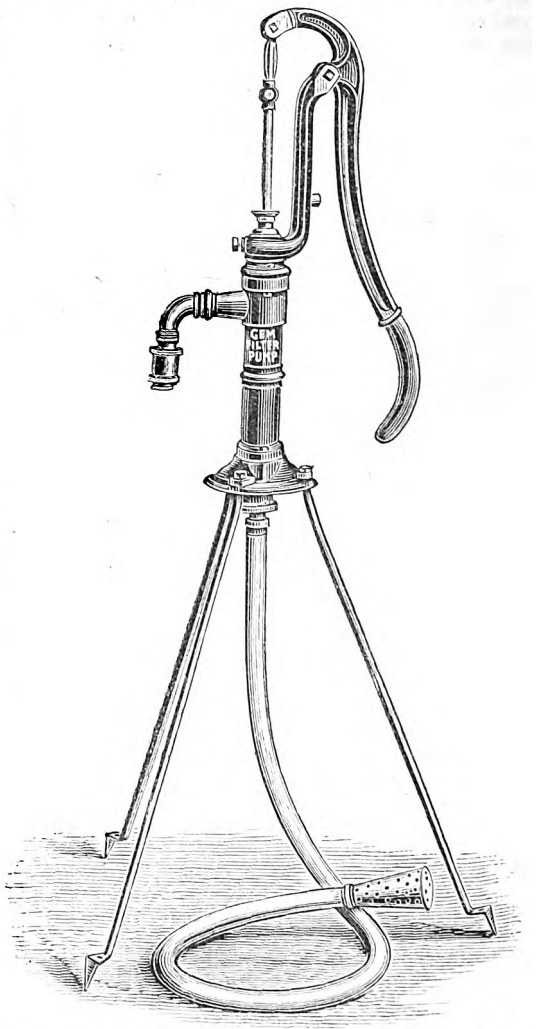
of these extensions is to enable the firm to have always in hand a stock of girders, channel iron, and fish-plates sufficient to meet at once the requirements of any building operations that may be in progress in the district over which their business extends. For this purpose they have made a large addition to their already capacious warehouses specially set apart for stocking the above descriptions of goods in every possible size, from girder sections of 3 inches up to 20 inches deep, and in lengths up to 40 feet, the stock of girders kept constantly on hand being upwards of 4,000 tons, in addition to fish-plates for girder construction and all descriptions of channel iron. This warehouse, which is over 100 yards long by 130 feet wide, occupies an extensive range of buildings in Lees Street, Manchester. On the opposite side of the same street the firm have another large warehouse specially set apart for all descriptions of hoops for packing purposes, coopering, or any other requirements. This occupies three floors, with suitable special machinery for painting the hoops in any required colours, and many hundreds of tons are always kept in store. In addition, there are two warehouses in Port Street, adjoining the offices, which are set apart for all descriptions of manufactured iron required in an ordinary merchant's trade, including bars, sheets, plates, and, in fact, all classes of finished iron.

LEEDS

Engines, Tools, &c.—John Fowler & Co. (Limited) have had a moderately good demand for steam ploughing-machinery, and for their special traction-engines, constructed for threshing work, they have not been able to supply customers fast enough. With a view to their greater efficiency, these engines are now fitted with a very sensitive quick-speed governor, which the firm believe to be the best of the kind in the market. They are now employed on some large winding and hauling engines for various parts of the country, and are completing some large locomotives for South America. Another specialty is portable railway-plant, including narrow-gauge locomotives and rolling-stock, for which they have numerous inquiries. They have completed the erection of the engines for the City of London and Southwark Railway, and several road-rollers are in course of construction for the home and foreign market. The success of Fowler's system of steam-ploughing depends so much upon the quality of the wire rope used that for a long time their efforts have been directed to the production of the very best kind. For their purpose it is absolutely necessary that great toughness should be combined with a very high tensile strain. In addition to the "Plough" they make a quality known as "Fowler's Special," the wire for which is made expressly and solely for their use, each stage of manufacture being conducted specially with the aim of producing wire to their standard. It is considerably used in England for underground hauling, and the firm have a great demand for it. Mr. J. R. Wocdhead, Whitehall Road, the patentee and sole maker of the "Leeds" gas-engine, has in hand good orders. A great feature is its simplicity, the working-parts being reduced to the smallest possible compass. The multifarious uses to which it can be put has brought in a large amount of business. It is steady, easy of regulation, with, it is claimed, the simplest igniter invented. It is in use at the Leeds Exhibition supplying power to several exhibitors, and numerous orders have resulted. In steam-hammers, also, a good trade is being done. Particular attention has been bestowed upon this department of late. A large order for special hammers for boiler-flue welding has just been completed, and inquiries are likely to result in further work of the same kind. Mr. John Robson, Shipley, patented a gas-engine a short time ago known as the "Shipley." He spent a considerable time in developing his ideas, and he has produced what is a really good engine. It is on view at the Leeds Exhibition, and secures considerable attention. The engine rests on its own bed, and the patented improvements are such that free passages to all ports enable it to run without loss of power. All the working-parts are made of steel or best iron, and all the bushes are of phosphor-bronze. Embleton & Co., Black Bull Street, find trade good. Tools, heavy and light, are in hand, and complete plant for railway-workshops, including every necessary appliance, is supplied. They are busy with special machinery for railway-wheel makers. A large quantity of Government work has been in hand, and is about completed. In the cut-nail trade there has been a fair demand, but since the last month of the quarter came in there has been the usual falling-off. Bates & Thornton report good business in their patent wrought-iron nails and spikes.

The "Gem" Filter Pump.—The success which has attended the business of the Gem Water-filter Company is satisfactory. The handiness and adaptability of the filter for all household or other purposes, and the fact that it can be attached to any ordinary water-tap without alteration go a great way to make it popular. The specially prepared ground quartz, which is the filtering-medium, has proved to be all that was expected as an efficient filterer; and medical officers of health from different parts of the country have testified to the value of this useful little article. But there was a difficulty in the way of its use in villages or in sparsely populated parts of the colonies and in places where there were no water-taps, and the inventor has placed on the market a portable pump



known as the "Gem" filter pump. As will be seen by the illustration, it stands on a tripod stand, the sharp points of which can be stuck into the ground whenever required. The pump is very strongly made, though only weighing about 45 lbs. It has a 2-inch barrel with brass rod and stuffing-box, and has an indiarubber suction-pipe (with perforated nozzle) attached by a union joint. The filter is put on the nose of the pump and taken off when not required. For river or well this invention is simply invaluable, pure water

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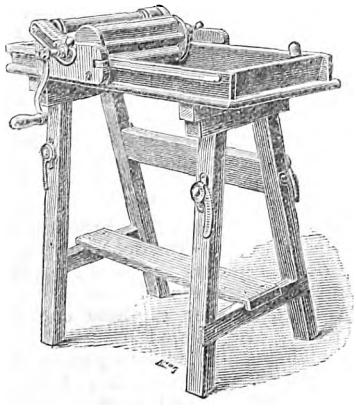
being supplied when the pump and filter are used. It should be stated that the filter requires reversing daily when in use, or oftener if the water is very dirty. By simply throwing the indiarubber pipe into any brook or pond drinking water is at once procured. Some of these pumps are already on their way to Australia and New Zealand.

LEICESTER.

Business is fairly steady, and has been in most instances satisfactory in every way. Here and there complaints find expression, but, taking the year's trading as a whole, up to the present the accounts may be accepted as satisfactory.

Gent & Co. speak very favourably of business in the electrical department, the output having exceeded all former experience, and, although they moved into more extensive premises two or three years ago, their trade has progressed in such a ratio that they are now seriously considering the advisability of doubling the present accommodation. Building operations will be shortly commenced. The firm have just completed supplies of electric bells and indicators for Cook's Nile steamers. A large Government contract is in hand, an important installation of electric lighting has just been finished at Chester, and they are engaged upon one for a factory at Leicester where a 500-light dynamo is being fixed, with all the fittings necessary for its complete lighting. In the specialty line the firm are obtaining a reputation for supplying watchmen's tell-tale clocks, one of the latest orders in this branch being to fit up the Western Counties Lunatic Asylum. A new alarm for awaking servants has some features worthy of notice, and it proves how readily certain electric appliances adapt themselves to existing ones. By an attachment to an ordinary clock situated in any part of the house an alarm can be fitted to go off at any time desired in one or more rooms, and the peculiarity of the arrangement is that, if the servant gets up and switches it off, a few minutes later —unless the contact is broken at the clock itself—the alarm will be repeated in the master's or mistress's bedroom. With such an appliance it would seem to be difficult for anyone to find an excuse for oversleeping, especially if the alarm goes off in several rooms at the same time, or within a few minutes' interval of each other.

Vipan & Headly speak of business being fairly good, especially in dairy utensils and milk-trade appliances, but the implement department maintains a sluggishness which has pervaded it for some years. To compensate for this, business in milk-carts, railway-churns, and accessories for the milk trade has shown a steady increase, the style and



character of the specialties in this department assisting in obtaining repeat orders and furthering the trade in general. One of the latest efforts of the firm in this branch of industry is the production of a handy butter-worker, styled the "Little Leicester," which is depicted in the accompanying illustration. It is made with or without a stand, as desired, so that if no stand is supplied it can be placed on a table, thus giving it the necessary height for conveniently manipulating the butter. For small dairies it is especially useful. The firm supply all requisites for dairy use or the handling of milk, and, with a growing demand for separated milk, the outlook as regards the growth of this particular industry is fairly good. The firm also have a department for the manufacture of garden-seats and other requisites for outdoor use.

Frank Ashwell & Co. report an active business in ventilating and heating appliances and in wrought-iron casements, supplies of the latter having been sent to Nottingham Castle and other buildings of importance. The firm have several contracts in hand for heating and ventilating lunatic asylums in various parts of the country, an unqualified success of their system as employed at Nottingham being testified to by the medical authorities, and, in consequence, business has accrued in a very satisfactory manner. Among the works in hand are comprised the Claybury Asylum for the London County Council, the Cheshire County Asylum at Macclesfield, and a new board school at Leicester for the accommodation of 1,600 children. The combination range brought out by the firm a few years ago is "going" fairly well, and a new radiator for hot-water heating will shortly be introduced. General business is good, especially in the foundry department, which being unequal to the task of meeting the requirements of the firm adjoining premises have been acquired.

W. & A. Bates speak favourably of business in the indiarubber line, the demand for accessories used in the manufacture of cycles being exceedingly good. The cycling season has been one of the most successful as regards sales, and the firm have had a good share of the supplies, which included tires, pedal-blocks, and other special details. A large demand for cushioned tires has sprung up of late, and it has assumed dimensions which make it difficult for indiarubber manufacturers to realise that cyclists are serious about it. Nevertheless, the firm are making preparations to supply in large quantities this class of tire, and, if the "boom" comes, will be ready to meet it. Another specialty of their manufacture is the "Eclipse" cricket-ball, which has been in good demand.

The Wigston Foundry Company have a tolerably good share of orders on hand, the demand for ships' galley and cabin stoves being fairly active, while the sale of usual sizes in kitcheners and cottage ranges maintains a steady increase. Several new designs in cheap register tile-stoves have been introduced, and some of the productions in stoves, railings, and kerbs have gone off well. The "Orson" range is a new pattern, with a "taking" appearance. It has bright bands, nosings, and mounts, and is fitted with an open and close fire arrangement, having a good large oven and a side-boiler. All the details of construction are substantial and well devised. Among the medium quality register tile-stoves is a design fitted with a Doulton-ware canopy, a detail which harmonises well with certain selected tiles, and will no doubt be agreeable to a class of buyers who have tastes that way.

J. Jessop & Son are busy on orders chiefly for abroad, the works in hand comprising steam-cranes, overhead travellers, and other specialties in mechanical engineering. The firm is engaged on a locomotive for South Africa; an overhead traveller, with a lifting capacity of 40 tons, for Smyrna; and a 25-ton hand-crane for Abo. The whole of the year up to the present has brought its share of business, and general work has gone hand-in-hand with productions such as those described.

Mr. Thomas Heron has had a successful experience in this district with his duplex gas-burners, it being stated that over 40,000 have been sold within a few months.

The Leicester Cycle Company form a recent addition to the manufacturers of the town, and, judging from appearances, they are in earnest. The concern is located in a good-sized building, fitted with the most improved plant for turning out cycles, the present output being about 150 safeties per week. All the departments are skilfully planned, even to plating and enamelling, and the organisation for carrying on a wholesale trade in cycles seems to have been considered in every detail. A 75-horse power engine works the machinery, and the number of hands employed at the present moment is 200. A very successful machine, fitted with cushioned tires, as a light roadster, weighs 29 lbs., and the firm guarantee it to carry a load of 12 stone with perfect safety. Among other firms steadily employed may be mentioned Goodwin, Barsby & Co., Pearson & Bennion, E. Pattinson & Co., Death & Ellwood, Gimson & Co., Co:t & Paul, and Elgood Brothers.

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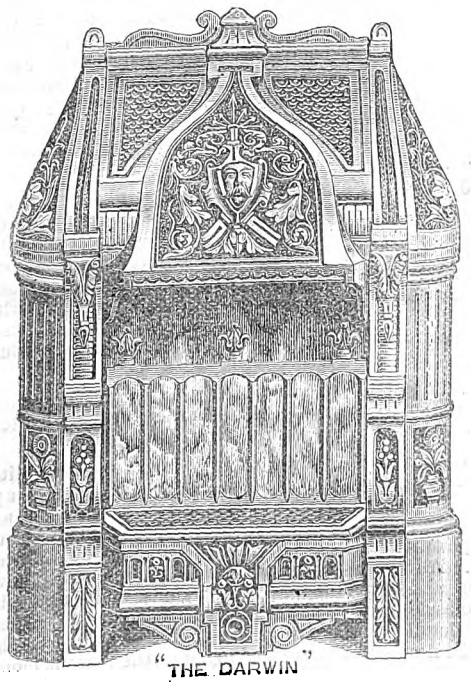
SCOTLAND.

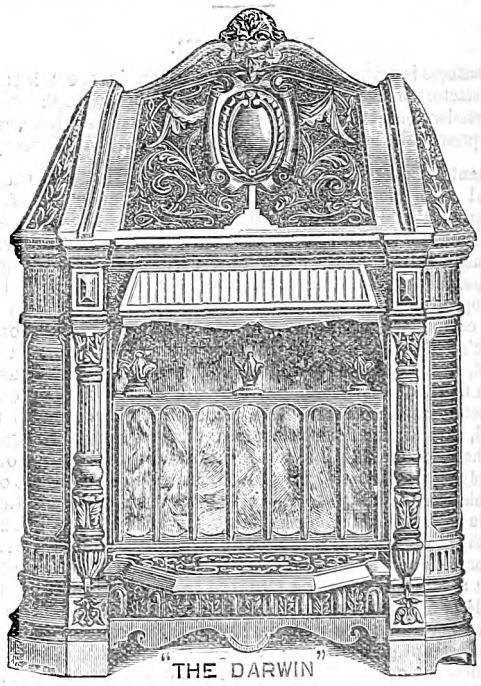
Shipments.—The shipments of iron and steel manufactured goods from Glasgow in the past week embraced locomotive engines and tenders to the value of 10,841*l.*; sewing-machines, 2,935*l.*; machinery, 25,137*l.*; steel goods, 11,886*l.*; and general iron manufactures, 21,750*l.*

Gas Engineering.—H. Darwin & Co. have recently opened business at St. Andrew's Works, 618–622 Eglinton

Street, Glasgow, and are introducing a number of new patents and designs in gas-fires, a few illustrations of which are here given. These are chiefly in the Italian and Renaissance style of art, and present a very attractive appearance, being elegant in design and graceful in outline. In addition to



these features, however, the patentees claim that they have not only effected a very material increase in the heating properties of their fires, but also an effectual improvement in the direction of economy in the consumption of gas, and a very close resemblance between these and ordinary coal-fires. A new Bunsen burner fitted with Darwin's patent silent jet will be supplied with the "Darwin" fires, which are finished in a variety of styles, and may be had in various sizes. Mr. Darwin, who has been for several years in the service of some of the best-known firms of gas-engineers, superintends the manufacture of these fires himself, and every effort in



the direction of economy in manufacture is being put forth, the works being well equipped with modern machinery for effecting rapidity and excellence in the execution of orders. Darwin & Co. take up the whole range of gas-engineering in its many branches, and are busy upon designs for hot-air, laundry, and cooking stoves, laboratory and hotel requisites, &c.

BRADFORD.

Engines, Pumps, &c.—Hanson, Carter & Co., Quebec Works, turn out a capital dust-proof engine, specially designed for driving small powers in places where the dust and grit greatly interfere with the working of an ordinary open engine. In such places as stoke-holes on shipboard, iron-foundries, boiler-houses, for driving mechanical stokers, &c., this engine is found very advantageous. It is of the ordinary construction, with plain side valve and eccentric motion, is very simple, and is easily repaired by an ordinary mechanic. The whole of the working parts are entirely enclosed in one casing, which forms the bed of the engine, and there is a hinged door on each side, affording ready access for oiling or repairs. These doors have felt facings attached round the inside edge, and a strong handle on one side. The door being closed and the handle turned down tightens the door against the body of the engine, and thus presses the felt and makes a dust-proof connection. A large number of these engines are being supplied. In pumps, also, a good business is done. Their improved horizontal steam-pump is very compact, and everything is easy to get at. It is so arranged that any water-leakage from the stuffing-boxes is caught and drained away. All glands and stuffing-boxes are bushed with brass, and the crank-shaft is much stronger than usually made, to prevent leakage. The necks also are unusually large, and the valves, which all work vertically, are made the same size as the pump-plunger on the suction side. These pumps are being supplied for pumping water for all purposes, for feeding boilers, and are excellent for steam fire-engines. Fire-engines also form a leading feature in the business of this firm. Their stationary steam fire-engine has a good sale, and orders are in hand for various towns. To prevent corrosion all the working parts are of brass. The engine is double acting,

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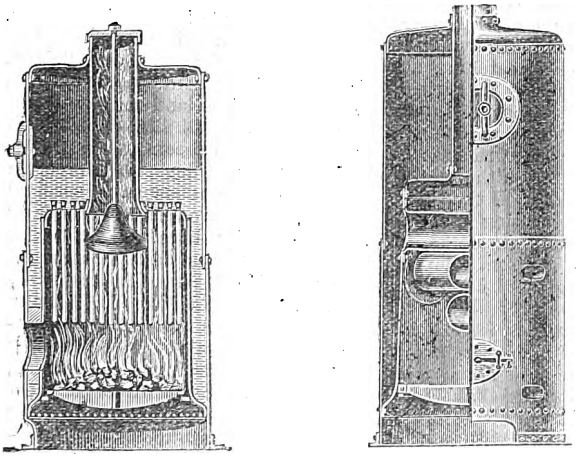
with bucket and plunger, and will deliver a perfect stream of water as regular and as steady as the pressure. The pump is also specially constructed for pumping water to any height, and is suitable alike for collieries, water ballast irrigation, and contractors' work. Some capital steam-engines, both vertical and horizontal, have been turned out.

GRANTHAM.

Steam-boilers, &c.—The Grantham Crank and Iron Company (Limited), of this town, in addition to their titular industry, are now largely engaged in the manufacture of steam-boilers, and amongst the various specialties of this kind, for which they are at the present time finding an excellent demand from various parts of the world, may be mentioned their vertical cross-tube boiler—a form of steam-generator which has rapidly grown in favour, owing to its durability and its greater freedom from accident from impure water and inattention than the usual type of multi-tubular boilers. When required for countries where wood is used for fuel the size of the fire-box is increased. Another type of boiler which has proved very economical in fuel is the "Field" tube type, shown in the illustration.



Similar tubes are applied to Cornish and other boilers for increasing their evaporative efficiency. In addition to the types mentioned, the Grantham Crank and Iron Company also manufacture portable, Cornish, Lancashire, and marine boilers. At present they have in hand Cornish boilers up to 22 feet long by 5 feet 6 inches diameter, and Lancashire boilers 28 feet long by 7 feet diameter. When required for abroad these larger sizes are often supplied in loose plates, ready fitted for riveting together on arriving at their destination.

NORTH STAFFORDSHIRE.

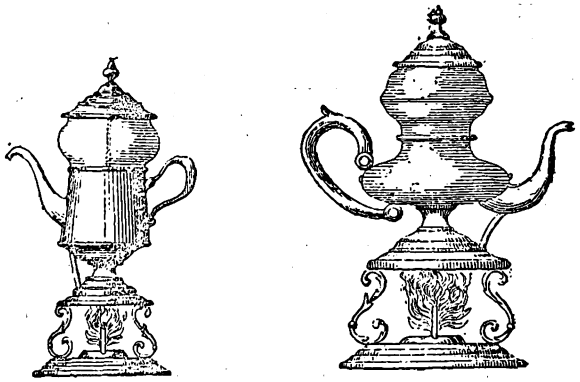
The Tile Trade.—The business on home account during the season has been very satisfactory, and the foreign business in all markets excepting South America has been well maintained. Mintons (Limited), Stoke-on-Trent, in the general run of tiles and slabs are busy alike on home and foreign account, and they are introducing another of their specialties in slabs. The innovation is a 12 by 6 slab, portraying views which are printed on the slab in very close imitation of hand-painted work. Mr. T. A. Simpson, in all descriptions of decorative tiles reports business fairly satisfactory. Minton, Hollins & Co. have had a satisfactory season, and have a sufficiency of orders on the books to remove all anxiety as to work for the winter months. George Woolliscroft & Son, Hanley, have found it necessary, in order to cope with the increase of orders, to extend their premises to almost double their present size. They continue very busy, and have good prospects in forward orders. Amongst some of the recent contracts is one for the decorative tiles to be used in the flooring and walls of the new High Court at Madras, whither they have despatched 1,000 yards of flooring tiles and 1,000 yards of wall tiles glazed. These are to be incorporated in very rich medallion-work patterns, both for the witness and waiting halls. This firm, who manufacture a patent hydraulic tile, have just made additions to the machinery which makes the quality of the tiles finer. They have also issued a little novelty in the form of a cigar-ash tray, which should be especially acceptable to the Masonic fraternity, as it is illustrated with some of their devices. Sherwin & Cotton, Hanley, continue fairly busy, as also do the Decorative and Tile Company, Hanley, who have satisfactory lines on their books for the foreign as well as the home markets. T. & R. Boote continue to pay attention to the bringing out of perfect designs, the illustrated patterns of which they are shortly issuing, and they report that trade is fully maintained. Mr. T. W. Twyford, Cliff Vale Pottery, Hanley, is well engaged in all his standard designs of sanitary earthenware.

FRENCH HARDWARE IN FOREIGN MARKETS.

(FROM OUR PARIS CORRESPONDENT.)

THE competition of French hardware with British goods in foreign markets has attracted less attention than that of Belgian, German, and American products. Nevertheless, it is sufficiently extensive, and it is more to be feared than other Continental rivalry, because it affects a superior and more profitable class of trade. French hardware manufacturers state that they are increasing their trade in many foreign markets by reason of the attractive appearance and excellent quality of their goods, and in certain specialties they are already securing pre-eminence in many markets. In scissors and table cutlery of the highest quality, in silver and plated ware, in fancy bronzes and cast and wrought iron ornamental work, in light malleable castings, in steel toys, in small domestic appliances, and in hand and machine tools of special design this is particularly the case. In curry-combs of the most expensive class French makers have lately taken a leading position in South America, Mexico, and other markets, and in garden-furniture, &c., a trade is being rapidly cultivated with Australia, Great Britain, and the United States. In wrought-iron ornaments demand, largely on foreign account, is so brisk that the existing concerns are working full time, and new firms are entering the business. If the proposal for establishing a French commercial propaganda in connection with the Consular service is carried into effect, and if, as seems likely, the fiscal arrangements include the free admission of metallurgical raw materials, French competition may become as formidable for superior classes of hardware goods as that of Germany and Belgium is already in the cheaper products. There is much activity in nearly all the characteristic branches of the French hardware industries, and foreign inquiries are coming in much more vigorously, as the result of the displays made by the leading firms at last year's Paris Exhibition.

In the hollow-ware trade the extensive adoption by the French makers of steel and nickel, and the elegance of the



designs, have brought their products into favour in many foreign markets, and in culinary utensils some of the leading makers report that they have obtained a considerable custom

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from English ironmongers and merchants. A leading firm with such an experience is that of Mr. Déglise, Rue Oberkampf, Paris. This maker has lately produced some tea and coffee pots of novel design, which we illustrate. They are specially designed to secure quickness in boiling the water and an efficient preparation of the drink. As the water boils it rises through a hollow tube, and is discharged from the top into a perforated receptacle containing the tea or coffee. By this means a constant circulation of water is kept up, and the full flavour of the leaf or berry is extracted. The *cafétière* form shown is made either of white metal, with glass top, or of nickel-plated copper; the teapot is made simply of white metal. Other designs of tea and coffee pots, saucepans, &c., are made in tinplate, in copper, in brass, and in bronze. They are all specially adapted to the needs of those who employ one room as both a sitting-room and a kitchen, and therefore desire culinary appliances of a specially ornamental appearance. Mr. Déglise also manufactures large portable culinary apparatus, specially adapted to colonial and export requirements. These have been adopted in the French army, and have also been supplied by Mr. Déglise to the Italian Government.

Other French houses who make a specialty of white-metal and nickel hollow-ware are meeting with substantial results abroad. Among these may be mentioned the Société Française de Fabrication de Nickel, Paris, whose solid nickel-ware is in increasing demand on Continental account. This company is cultivating a trade with England.

Thessier Frères report themselves as doing an important and increasing trade with several of the British colonies, and more especially Australia, in seltzogenes and syphons. MM. Thessier complain, however, that English and other foreign buyers of their manufactures are being misled by the imitations of other French producers.

In light hardwares, pumps, and garden appliances Japy Frères & Cie., rue Chateau d'eau, Paris, report a favourable home and foreign demand for most of their specialties. They are doing a satisfactory English and colonial business through the medium of their London house in Queen Victoria Street.

Another firm which does a good trade in almost all descriptions of hardware goods with England and the British colonies is Peugeot Frères, Valentigney, Doubs. Their list of saws, hammers, pincers, vices, and other tools includes patterns suited to the requirements of nearly every export market, and comprises axes of the American type. In cast-iron coffee and other mills, with forged-steel movements, the firm maintain a formidable rivalry against British manufacturers on the Continent, in the East, in South America, and elsewhere.

M. Burton Fils, rue des Marais, Paris, and Nugent Works, Oise, is another firm which has an English house—at 16 Union Court, Old Broad Street. M. Burton reports an excellent English demand for his patent duplex pump, and home and export inquiry is generally so brisk that it has been found necessary to extend the warehouse after only eighteen months' tenancy of the present building. The firm is doing a large business all over Europe with the "Tanite" emery-mill, and has recently taken good orders from Java and Hayti for its elevators. Russia is also a good customer in this branch. As agents for the "Standard" twist-drill, the firm report an excellent Continental demand for that machine.

One branch of mechanical industry in which French manufacturers have achieved peculiar success is that of saw manufacture. The export demand for band and other saws for special purposes is very brisk, and the industry is a growing one. The well-known firm of Dugujon Aîné, rue de Lyon, are briskly occupied on home and export account in this branch. M. Tiersot, rue de Gravilliers, Paris, produces a remarkable variety of hand and machine saws for every possible class of work. This maker devotes special attention to the manufacture of fret-saws, and with the increasing popularity of fretwork as an amusement and occupation in England he anticipates a considerably increased demand for his products in this line from that market. The trade in fret-saws forms, it may be remarked, a recognised and not unimportant feature of the French ironmonger's business. M. Tiersot's patterns cover all the requirements of the fretwork amateur. He manufactures small machine-saws that will allow ladies and children to perform difficult work without fatigue. One of these machines will cut metal 1 centimetre thick with the utmost ease. He publishes designs such as can be easily executed with the aid of his saws. Besides saws, M. Tiersot makes a large variety of light machine-tools, for the treatment of wood, metals, and textiles, and also all classes of general workmen's tools.

THE FRENCH IRON AND HARDWARE INDUSTRIES.

(FROM OUR OWN CORRESPONDENT.)

PARIS, Wednesday.

THE stronger feeling mentioned last week has continued to develop in the French iron market, and at present the position is more hopeful than it has been for some time past. Demand for girder iron and special sections is active, and there is an appreciable improvement in the call for ordinary merchant qualities. Consumers are evidently placing orders under the belief that prices will move upwards, and, independently of this conviction, they are forced to give out new business by the nearly complete depletion of their stocks. Another influence towards firmness in prices is afforded in the threatening attitude of both the French and Belgian colliers. In Paris 6*l.* 16*s.* per ton is now firmly demanded in actual business for No. 1 merchant iron, and only orders of exceptional extent will be accepted at 6*l.* 12*s.* No. 1 joists are still firmer at 7*l.* per ton, and No. 2 sheets are 4*s.* per ton better on the week at 7*l.* 16*s.* Forward demand is reported brisker in the Nord. The local ironmasters have just held a meeting at Valenciennes, and have fixed the basis figure at works, for second-quality bars and joists, at 6*l.* per ton. Superior bars are 6*l.* 8*s.* and 6*l.* 16*s*; ordinary angles, 6*l.* 16*s.*; common plates, No. 2, 7*l.* to 7*l.* 4*s.*; corrugated, 8*l.* 4*s*; tank-plates, 7*l.* 12*s.* to 7*l.* 16*s.*; No. 3 boiler qualities, 9*l.* In the Ardennes there is a better forward inquiry this week, and prices are firmer at 6*l.* 8*s.* per ton for the basis numbers of ordinary merchant iron. Best iron is, however, slightly weaker at 9*l.* 12*s.* per ton, while Siemens-Martin steel for gun-making is quoted 10*l.* Orders are arriving with moderate activity at ironworks in the Haute-Marne, and quotations are firm at 6*l.* 16*s.* to 7*l.* per ton at works for the first four classes of ordinary iron. In the Centre the basis figure for No. 1 iron remains nominally at 7*l.* 12*s.* to 7*l.* 16*s.* per ton for bars and 8*l.* 4*s.* for hoops. In Southern France ordinary hoops are quoted 8*l.* 16*s.* to 9*l.* 12*s.*, and first-quality iron is 10*l.* 8*s.* to 11*l.* 4*s.* In both these two districts the current employment at the iron and steel works is mainly on account of old contracts. An important addition is about to be made to French metallurgical production by the restarting of the well-known Terre-Noire Ironworks (Loire), concerning the probable fate of which there has been so much said lately. These works comprise 17 puddling-furnaces, 22 furnaces for the re-heating of sheets, and 9 rolling-mills. Their capacity of output is 140 to 150 tons of finished iron per day of twelve hours, pretty equally divided between merchant iron and sheets. The company which has been formed to restart the works will not work them to their full capacity, and the large plate-rolling mill will be abolished. Boiler and engineering shops will be added, however, and the manufacture of railway and tramway material will be commenced. Only 500 or 600 men will at first be employed, a number much smaller than found work under the old Terre-Noire Company. The capital of the new concern is 120,000*l.*, and of this sum 20,000*l.* to 24,000*l.* will be expended upon new plant, &c. Two large metal-consumers in the Rhone district are concerned in the formation of the company, and they have undertaken to provide sufficient orders to keep the works going six months out of the year.

In the pig-iron trade there is a fair amount of business doing, and prices are maintained in a steady position by the continued firmness in the fuel market. Longwy forge qualities remain at a minimum of 44*s.* per ton, and No. 3 foundry is 10*s.* dearer. The Masnoval blast-furnace has just been blown in in the Haute-Marne, having been demolished and completely reconstructed within a period of four months. Forge coal in the Ardennes is 12*s.* 8*d.* per ton.

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The character of the new fiscal system which will come into force in France at the beginning of 1892 can now be accurately forecast. The Minister of Commerce will present a scheme embodying the recommendations of the commercial community as represented in the various chambers of commerce in the next session of Parliament. The leading idea of the new tariff proposals will be to refuse favourable terms to the manufacturers of any nation that does not accord favourable terms to French manufacturers, and a policy of reprisal will almost certainly be attempted against America. There is also a very strong feeling in the Chamber and elsewhere against the continuance of the "most-favoured-nation" treatment at present accorded to Germany. In accordance with the nearly unanimous wishes of the industrial community the duties upon nearly all classes of manufactured goods will probably be increased. Other machinery than that required for agricultural purposes is likely to be heavily taxed. On the other hand, it is known that there is a strong inclination to concede the free admission of all classes of raw materials. The ironfounders have for some time past been agitating for free pig iron, and now the forge-masters are following their example. A striking instance of the repressive influence which a protective system exercises upon export trade is afforded in a recent experience of MM. Eiffel & Cie. This firm has just taken an order for a railway-bridge for Portugal weighing 3,000 tons. The engineering-work will be executed at the firm's workshops at Levallois (Paris), but the order for 2,000 tons of the iron required has gone to Belgian ironmasters. It is explained that this diversion of the order from French forges is due to the fact that Belgian iron to be used in engineering-work intended for abroad can be imported into France free. There is no such drawback upon foreign pig iron, however, and, as the protected French pig iron at present costs more to native than to Belgian or German consumers, it is quite possible to employ French raw material to underquote French finished ironmasters. Considering the importance of England's purchases from France, the new fiscal arrangements ought to interfere with English metallurgical and hardware imports into this country less than with those of any other nation.

Business in the hardware industries is generally fairly brisk, and season orders are being received in the winter branches in satisfactory numbers. The ironfounders complain of dulness in the demand for general castings, but in specialties and in mechanical and constructive ironfoundry business is fairly brisk. The Dommartin Foundry, Haute-Marne, has just found a purchaser at 3,800*l*.—an extraordinarily low figure. Engineers and machinists, and the various subsidiary metallurgical industries depending upon them, are actively engaged. The firm of Aymard & Thomas have received an order from Tunis for two iron bridges.

THE IRON TRADE IN GERMANY.

THE iron-ore trade in the Siegen-Nassau district is rather dull at the present time, but for Luxemburg and Lorraine minette ore quite a brisk call exists. The blast-furnace proprietors are in rather a bad way, owing to many of them having to make deliveries for puddling and steel-manufacturing purposes on old contracts, and at prices which at the current rates for coke involve a dead loss upon every ton of pig so supplied. Very few furnaces are yet engaged on contracts concluded at paying rates. Owing to this unsatisfactory state of things more furnaces in the Siegen district, it is expected, will shortly be laid off. Already there are furnaces idle at Birleback, at the Johannes Works, at Alte Scheld, Gosenbach, Eiserfeld, Grünebach, and Alter Herdorf, the daily capacity aggregating 240 tons. Several of these will, however, be again at work within the next three months. The make of pig iron in the Rhine-Westphalian district during August was 115,200 tons, as against 118,800 tons in July, and 124,700 tons in August, 1889. Stocks during the month increased from 83,700 tons to 96,900 tons. Manufactured iron in Westphalia is neglected, buyers of bar and fashioned sorts being scarce and not disposed to fill more than their most pressing requirements. Rather more activity is reported in boiler and coarse sheets, due in some measure to the recently-given-out Government orders for locomotives, but also in part to the reduction in prices agreed to by the Association, consequent upon the drop in pig iron. Hoop iron is also cheaper. In rolled and drawn wire and wire nails business continues dull. For rivets the current call is slow. For good merchantable brands of iron, as well as for boiler, bridge, and ship plates, prices have dropped to 200m. as the basis figure. The engineering establishments, iron-foundries, and railway rolling-stock concerns in this district continue fairly busy.

It is reported that the Association of South German Rolling-mill Proprietors has again reduced the price of rolled iron, and this time by 20m. per ton, as from September 15, leaving the net rate at Neunkirchen only 133m., and even this figure, it is understood, has been cut by makers nominally belonging to the cartell.

For the completion of the Rhine-Weser-Elbe Canal, including the series of waterways from Dortmund to the Ems landing-places, it is estimated that some 200,000 tons of steel and iron will be required. Of this total the rail-mills will supply 100,000 tons; the bridge-building, crane, and general engineering firms, 70,000 tons; and the ship builders, 30,000 tons. Along the route of the canal between the Rhine, the Weser, and the Elbe, and on to the lower Ems, about 55 large and small docks will be required, and connecting with these there must necessarily be railway goods depôts, which latter in turn must be in direct communication with the main lines of railway and with the chief manufacturing works in their respective neighbourhoods. This installation alone is expected to necessitate the laying of about 600 kilometres of track, the putting in of 1,500 crossings, 200 turn-tables, 150 cranes, coal-shoots and elevators, the construction of 400 large and small subways, including aqueducts, 600 road bridges, 50 locks, the building of 1,200 canal boats and steam-tugs, together with the usual accessories needed in the modern equipment of steam-worked land and water ways.

The prices at which the large quantities of locomotives ordered recently by the Prussian Railway Ministry were taken ranged between 45,000m. and 52,000m. each. These figures, although about 1,000m. below the offers previously sent in, and at that time declined, are still sufficiently high to leave the makers a handsome profit. Foreign competition in locomotive supply is almost unknown to-day in Germany, and even in the neutral markets of Southern Europe Germany is quite able to hold its own. So far as the home industry is concerned the trade is combined in two groups which mutually support each other. To the south group belong the Hartmann Works, Chemnitz, the Mayfarth Works in Munich, Krauss & Co., Augsburg, and the locomotive-works in Esslingen. To the northern section are accredited the works of Henschel, Egestorff, Schwartzkopff, Stettiner Vulcan, Union of Königsberg, Borsig, Gravenstade and Hohenzollern (Düsseldorf). The home requirements in locomotives for the present year are not yet covered. About 300 additional engines will probably be ordered shortly.

Steel-rail makers in Germany are quite jubilant over the success of the Bochum Company in the international competition for the supply of 11,000 tons of rails to the Roumanian State railways. Next to the Bochum price of 128 80f., free at Galatz, came the offer of the Gutehoffnungshütte, Oberhausen, at 137f. for a part only of the order; the Cockerill Company, Seraing, put in at 148 50f.; the French St. Chamond Company, at 165f.; and the Société des Aciéries, 177.80f. At the recent opening of tenders for the supply of rails to the Breslau Railway Administration both the Laurahütte and the Friedenhütte quoted the same price—viz, 150m. at works station. The Laurahütte, however, only tendered for 550 tons, leaving the Friedenhütte to take the remaining 3,750 tons if they so wished. The explanation appears to be that the smaller lot are wanted by November, whilst deliveries of the bulk of the order will extend over until July next. This is not a very healthy sign for the Upper Silesian rail-works, bearing in mind that this time last year nearly four times the weight of rails was required by the same administration. The tenders opened by the Right Rhine Railway Administration last week showed the following results:—For 3,027 tons of iron sleepers, Phœnix, Laar, 134m. per ton; Stahlindustrie, Bochum, 134.25m.; Osnabrück Steelworks, 136 25m.; Bochumer Verein and Dortmund Union, 139.50m. each. For 5,416 tons steel rails:—Aachener Hütten, 144m.; Rheinische Steelworks,

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Meiderich, 145m.; Gutehoffnungshütte, Oberhausen, 145m.; Osnabrück, 147m.; Krupp and Dortmund Union, 150m. On October 15 tenders for 7,200 tons of steel rails will be opened by the Railway Direction in Hanover.

The German Consul in Costa Rica, reporting on trade with that country, states that, whilst the imports from France and the United States during 1889 remained about stationary, the value of English imports had increased by 20,000 pesetas, and that of Germany 274,698 pesetas, the total value being 1,229,340 pesetas. This increase in trade is attributed to the approximation on the part of German traders to the English system of doing business, and also to the longer credits allowed. The lower prices—especially for hardware articles—at which the German goods were offered are also adduced as an important factor in the augmentation of the trade.

TRADE WITH CHINA.

WRITING under date June 14 last on the trade of Canton for 1889, Consul Alabaster states that in the matter of imports lead for lining tea-boxes heads the list of metals, and, strange to say, although it would be thought that the rolling facilities at home would have led ere this to suitable rolled strips being introduced, it is still entirely imported in pigs. Quicksilver follows, used as it is largely for silvering the small mirrors formerly imported from abroad, but now largely or almost entirely made here, and for the manufacture of the universally-used vermilion. Tin is also in demand, and yellow metal sheathing has made a large advance in the year, although the latter, it is understood, is chiefly used for making imitations of the new cash issued from the Mint, and not for coppering ship's bottoms. The returns, however, do not show the actual trade, for old iron of various descriptions, largely imported, is chiefly or entirely brought by junks, no less than 2,800*l.* value additional of iron alone being shown by the so-called Kowloon Commissioner's report to have been exported from Hongkong and imported into this province; for the trade has not interested the local firms here, being conducted entirely from Hongkong. In a few years a demand will probably arise for rails, as there is general talk of the introduction of the iron road, and when once it is commenced innumerable railway companies will in all probability be started. In the meantime the projected line from Hongkong to Canton seems to have been temporarily abandoned consequent on the increased tightness in the money market, and the projected tramway has utterly fallen through, the new bund on which it was to have been constructed having stopped before it had been carried a quarter of its projected distance.

In manufactured ironware there is no great market, but in time there should be. Machinery is already imported to some extent, the largest orders in this direction being the plant of the Mint already noticed in previous reports; the plant for some extensive paper-mills which have been set up some little distance from Canton, and which are already turning out good paper made from rags and bamboo shavings; and a few lathes and planing-machines have also been ordered. As time goes on the demand will be larger, especially if the collection of native ironware the Sheffield Chamber of Commerce are procuring leads the manufacturers at home to an intelligent study of Chinese needs, bearing in mind that the object is not a slavish following of Chinese models, but to produce articles which will do the work wanted better than those already in use.

There is great need also for agents to introduce the articles when made, for the Cantonese requires to be pressed to try anything new, though, when shown that it is useful, he has no objection to adopt it; and walking through the streets the passer-by is struck with the number of opportunities for pushing foreign inventions: every few yards, at the innumerable pork-butchers' shops, or the restaurants at which a large proportion of the population take their meals, one sees men laboriously chopping the meat into fine mince by hand, and wonders if anyone has ever tried to introduce a sausage-machine. In every shop there is a clumsy wooden till, and though in the furniture-shops there are to be noticed an increasing number of second-hand safes, there seems a large opening in this direction. The clumsy native razor is still in universal use, and although tailors in foreign employ gladly adopt the sewing-machine, and are always ready to appropriate a pair of scissors, the native sewing men and women still stitch away contentedly, taking a week to do what might be compassed in a few hours.

Of matches 261,506 gross, valued at 10,460*l.*, were imported viâ Hongkong by junk, and 192,948 gross, valued at 7,733*l.*, direct, but the same complaint is still made that it is impossible to get good matches—indeed, the state of things is worse than before. English were long ago ousted by German matches, and these in turn have been ousted by Japanese, and lately by Chinese imitations, each successive brand being worse than the one before. What there may be in bad matches which fits them for the Cantonese market it is difficult to say, but it is alleged that the explanation lies in the manner in which the trade is pushed by making large returns to purchasers: the nominal cost is the same, but the bulk being bought for the supply of consumers at a distance, the purchasers prefer those on which they get the largest return. The English makers make no returns, the agents of the better class of German matches make only a comparatively small return, but it is said that 75 per cent. has been in some cases allowed on the inferior articles which now swamp the market.

OILS, PAINTS, AND SUNDRIES.

Linseed Oil has ruled steady on the London market since last week. A slightly firmer tone was noticeable on Monday, but the movement was not sufficiently strong to affect prices, which are on the spot here for pipes at waterside 24*l.* 7*s.* 6*d.*, landed 24*l.* 10*s.*; barrels, 24*l.* 15*s.*; for September-October, 24*l.* 12*s.* 6*d.*; September-December, 24*l.* 10*s.* At Hull spot oil is quoted 23*l.* 5*s.*; January-April, 23*l.*; and September-December, 23*l.* 5*s.* On the Liverpool market a rather quieter tone has prevailed, with a limited inquiry at 25*s.* 6*d.* to 26*s.* per cwt. in export casks.

Rape Oil has moved off rather slowly during the last few days, and London prices have shown a tendency to droop, brown on the spot, and also December-January deliveries, being about 5*s.* less on Monday than at the close of last week. Brown on spot is offered at 29*l.*, and January-April at 28*l.* 15*s.* Spot refined is 30*l.* At Liverpool refined Stettin is held for 35*s.* 6*d.*, and English for 32*s.* Fine Belgian offers at 31*s.* 6*d.*

Cottonseed Oil on the London market has declined about 5*s.* on last week's closing prices. Spot crude is 17*l.* 10*s.*; refined ordinary spot, 20*l.* 10*s.*; September-October, 20*l.* 5*s.*; November-April, 20*l.* 10*s.* At Hull naked spot is 18*l.* 15*s.*; September-October, 18*l.* 17*s.* 6*d.*; November-April, 19*l.* to 19*l.* 2*s.* 6*d.*; crude, 16*l.* 15*s.* to 16*l.* 17*s.* 6*d.* spot. At Liverpool business has been dull, with prices down about 5*s.*, in sympathy with London quotations.

Olive Oil has been slow of sale, but sellers are firm at from 34*l.* 10*s.* to 35*l.* for Mogador, and 39*l.* to 41*l.* for Spanish. At Liverpool the market has ruled steady, but with a restricted consumptive demand.

Cocoanut Oil is advancing. For spot pipes 33*l.* 10*s.* was paid on the London market on Monday, and near-at-hand lots c.i.f. realised 32*l.* For September-October 30*l.* 10*s.* to 30*l.* 15*s.* was quoted. Cochin ruled firm at 34*l.* for spot and 33*l.* 10*s.* c.i.f. to arrive. On Tuesday, Ceylon spot pipes were 33*l.* 15*s.* to 34*l.*; near-at-hand, 32*l.* 10*s.* c.i.f.; and September-November, 31*l.* ditto; Cochin on the spot, 34*l.* to 34*l.* 10*s.*, and to arrive, 33*l.* 10*s.* c.i.f.

Palm Oil has been a strong market at Liverpool, sellers advancing their rates after every transaction. Prices show a rise of about 1*l.* 10*s.* over last week. Lagos was quoted on Tuesday 29*l.* 10*s.* per ton on spot, and 29*l.* 5*s.* to arrive, with Benin at 27*l.* 10*s.* per ton, and further advances are expected.

Petroleum has ruled quiet, and prices have not shown any appreciable variation for some days past. American spot is $5\frac{3}{8}d.$ to $5\frac{7}{16}d.$, and September-December $5\frac{5}{8}d.$ Russian spot is $5\frac{1}{4}d.$ to $5\frac{3}{8}d.$, and September-December, $5\frac{7}{16}d.$

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Lubricating Oil.—Black American or Russian is quoted at 6*l.* to 7*l.*, and refined at from 7*l.* 10*s.* to 12*l.*

Turpentine improved slightly in value at the beginning of the week, and sellers of spot American were asking 30*s.*, whilst for October–December 30*s.* 3*d.*, and for January–April 30*s.* 9*d.* were the firm quotations. Since then a rather easier tone has prevailed, and there are now sellers at about 6*d.* less than the above-quoted figures.

Rosin.—There has been rather more inquiry lately for strained, and spot is now quoted on the London market at 4*s.* 6*d.* For shipment 4*s.* 1½*d.* to 4*s.* 2*d.* is asked. At Liverpool common quality is selling steadily at from 3*s.* 10½*d.* to 4*s.*; medium, from 4*s.* 9*d.* to 6*s.*; and fine, from 7*s.* to 10*s.* per cwt.

Tallow has been moving up since last week. The London quotation for spot P.Y.C. on September 12 was 38*s.* 6*d.*; for Australian, good to fine, mutton, 27*s.* 9*d.* to 28*s.* 3*d.*; and for beef, 27*s.* to 27*s.* 6*d.* At the public sales on Friday in last week there was again a good supply and an adequate demand, and of 1,680 casks offered 1,609 found buyers at a further advance of 3*d.* to 6*d.*, whilst the medium qualities were 1*s.* dearer. Of 1,507 casks Australian offered 1,436 were sold: Mutton, fair to fine, 27*s.* 6*d.* to 28*s.* 3*d.*, and 25*s.* 6*d.* to 27*s.* 6*d.* for inferior to middling; mixed melting, 26*s.* 9*d.* to 27*s.* 3*d.* for very middling to fair; whilst beef found buyers at 27*s.* 6*d.* to 27*s.* 9*d.* for rather low to fine quality. P.Y.C. has advanced to 39*s.*, Australian fine mutton to 29*s.*, and beef to 28*s.* At Liverpool, South American beef is held for 30*s.* to 30*s.* 3*d.*, with sales at the latter price.

Tar.—Spot Stockholm is about 21*s.* 6*d.*, and Archangel 15*s.*

Oil Cake.—Linseed cakes are steady, American-made, from Calcutta, ranging from 6*l.* 15*s.* to 6*l.* 17*s.* 6*d.*, and Westerns 6*l.* 8*s.* 9*d.*; London-made is from 7*l.* 12*s.* 6*d.* to 8*l.* Rape cakes on the spot are obtainable at 4*l.* 10*s.* Cotton cakes are quiet. Spot, London-made, 4*l.* 5*s.* to 4*l.* 7*s.* 6*d.*; decorticated, 5*l.* 12*s.* 6*d.*

FOREIGN AND COLONIAL MARKETS.

Also see our latest Telegrams.

France.

PARIS, SEPT. 18.—*Copper.*—Chili bars, 162*f.* 50c.; ordinary brands, 157*f.* 50c.; ingots and sheets, 162*f.* 50c.; and best selected, 170*f.* *Tin.*—Banca, 265*f.*; Billiton, 262*f.* 50c.; Straits, 261*f.* 25c.; English, 260*f.* *Lead.*—Ordinary brands, at Havre, 34*f.* 25c. *Zinc.*—Silesian, crude, at Havre, 65*f.*; other good brands, 64*f.* 50c.

MARSEILLES, SEPT. 18.—*Copper.*—Chili refined ingots, 160*f.*; red rods, 195*f.* *Tin.*—Banca, 260*f.*; Straits, in ingots, 250*f.*; French rods, 260*f.* *Lead.*—Soft, second fusion, 31*f.* 50c.; pipes and sheets, 37*f.* *Zinc.*—Vieille-Montagne sheets, 75*f.*; ordinary sheets, 74*f.*

Germany.

BERLIN, SEPTEMBER 18.—*Copper.*—Mansfeld, 142m. to 145m.; Wallaroo, 145m. to 150m. *Tin.*—Banca, 208m. to 212m.; English Lamm, 208m. to 212m.; Australian, 210m. to 215m. *Zinc.*—Giesche, 51½m. to 52m.; Silesian, 50m. to 51m. *Lead.*—Spanish, 35m. to 36m.; Harz, 29m. to 30m.; Silesian, 29m. to 30m.

COLOGNE, SEPT. 18.—Current quotations:—Spiegel iron, 65m. to —m.; Bessemer iron, 75m. to —m.; white-grained pig, 72m.; Luxemburg puddled pig, 45m.; German foundry pig, No. 1, 75m. to —m.; do., No. 2, —m. to —m.; do., No. 3, 63m. to —m.; bar iron, first merchant quality, 165m.; fine grain, —m.; angles, 175m.; girders, 165m. to —m.; best boiler-plate, first quality, 220m.; seconds, 180m.; Siegen charcoal plates, 180m. to —m. per 1,000 kilos.; soft lead, 27½m. to 28½m.; spelter, 50½m. to 52½m. per 100 kilos.—*Cologne Gazette.*

Belgium.

BRUSSELS, SEPT. 17.—The pig-iron market has not varied appreciably since last week, the advantage then gained having been well maintained meantime. Manufactured iron is also firm and likely to go higher. Orders for girders are abundant, one of the chief makers in the Charleroi district is completely engaged for the next two or three months at the advanced prices and cannot take further orders. Prices rule as follows:—Luxemburg foundry pig (No. 5), 57*f.*; Charleroi foundry pig, 62*f.*; Charleroi strong puddled pig, 60*f.*; Charleroi ordinary puddled, 55*f.*; mottled, 55*f.*; Luxemburg puddled pig, 50*f.* Manufactured iron, No. 1 (for export) 135*f.*, (for home) 135*f.*; No. 2, 142*f.*; No. 3, 150*f.*; girders, 137*f.* 50c.; angles, 145*f.*; ship angles, 152*f.* 50c.; sheets, No. 2 (for export) 165*f.*, (for home) 165*f.*; No. 3, 185*f.*; No. 4, 255*f.* Steel sheets, 205*f.*

The United States.

PHILADELPHIA, PA., SEPT. 2.—*Pig Iron.*—There is not much change to notice in this department. Prices are steady, and the feeling is a little firmer. That is to say, those who are in the market for iron and want particular brands have no choice but to pay full quoted rates, while those who have a new brand, or something that does not happen to be just what is wanted at the time, may have to accept a comparatively low figure. There is no great amount of this class of iron offering, however, so that, on the whole, the market may be called steady, and unless there is some increase in supply or decrease in consumption, the chances are favourable for hardening in prices. The immediate outlook rather indicates a movement of that kind, but with such an enormous capacity for production there is very little chance of speculative buying, in the absence of which prices are not likely to vary materially from those recently ruling.

PITTSBURGH, SEPT. 2.—*Pig Iron.*—There has been no marked change in the situation during the past week; both production and consumption continue large, and the one keeps pace with the other. Prices have changed but little one way or the other. All the furnaces in condition are in blast and the output is immense, but consumption appears to be fully equal to the occasion. There is little or no accumulation.

CHICAGO, SEPT. 3.—*Pig Iron.*—In pig iron the week has been uneventful. A few options that were about to expire were closed by buyers on Monday at current prices, and some inquiry is noted for extended deliveries, but in general the local pig-iron houses have had but a light trade. They are not pushing sales with much vigour, as the furnaces are well supplied with orders and can easily endure a limited season of quietness. Some small Southern makers have made slight concessions, but this is not new, as it has been referred to in previous reports, and seems to have no influence on the market for leading brands. Prices may therefore be regarded as fairly firm and unchanged.

NEW YORK, SEPT. 3.—*American Pig.*—There has been only a run of moderate-sized orders, although some sellers report that an increase in them is observable.—*Iron Age.*

Canada.

TORONTO, AUG. 29.—General hardware appears to manifest a little more activity, but the trade say that the month of August has been the dullest experienced for some time. The opening of this week has exhibited a condition of the market that has been anticipated for some time, and prices to-day are somewhat higher in almost every line than they were a week ago, with every indication of still further advances at no very distant date. The iron market in the United States is reported as somewhat flat, which is at variance with recent communications from the British markets. Common bars are moving out of wholesalers' hands here at $2.35 to $2.40, but the market is rather quiet at the present time. The mills have taken contracts at $2.15, and dealers say the very best they can do with the mills is $2.10. There is no Nova Scotia iron in the market, but it is not particularly inquired for.

MONTREAL, AUG. 28.—The firm feeling that has characterised this market for some time resulted the other day in an advance of 50c. per ton in pig iron. This has been coming for some time under the gradual stiffening of the primary markets, and when the cable on the 25th noted the advance of Scotch warrants to 50*l.* 3*s.*, and the day after that the price of all grades of pig had been marked up 1*s.* per ton, an advance here was a natural result, and the outlook points to still higher prices, with ocean freights tending upwards as well as the material itself. Some buyers have apparently realised this, for there was considerable trading for both prompt and forward delivery at the higher figures, but there is still some disposition to doubt the permanence of the advance, but we think this course is slightly erroneous in view of present circumstances. The transactions in pig this week involved several round lots of Summerlee and equal brands, the bulk of the stock under negotiation being for forward delivery as the stocks here are small. In consequence of these transactions prices may now be quoted at $22.50 for Summerlee and equal brands, other lines in proportion. In bar iron we do not hear of much doing, but the inside figure is $2.25, and it is unlikely if anything but a round lot could be moved at this figure. Tinplates show no change, the firmness being unabated with a continued activity in Great Britain, and agents here will not talk business on anything except at outside figures unless after consultation with their principals. Business has been done during the past week to the extent of a couple of thousand boxes.

MERCHANTS' CIRCULARS.

Also see our latest Telegrams.

SCOTCH PIG IRON.

WILLIAM COLVIN & CO. (Glasgow) report:—

TUESDAY.—During last week the tone of the warrant market continued to improve, and a considerable business was transacted from 49*s.* 6½*d.* to 50*s.* 5*d.* cash, sellers remaining at latter quotations on Friday afternoon. On Monday the market opened strong, and the price advanced to 50*s.* 10*d.*, but it afterwards receded to 50*s.* 8*d.*, while to-day business was done from 50*s.* 7*d.* to 51*s.* 0½*d.*, closing with buyers at 51*s.*, sellers asking 51*s.* 1*d.* Hematite warrants have improved from 57*s.* 2*d.* to 58*s.* 1½*d.*, and Cleveland warrants are steady at 47*s.* 7½*d.*

	1890	1889
Shipments from Christmas to date (tons) ..	345,189	.. 303,017
Furnaces in blast at date	78	.. 83
Price of warrants at date	51*s.* 0*d.*	.. 47*s.* 2½*d.*
Stock in Glasgow store at date (tons) ..	657,699	.. 1,010,284

Imports of Middlesborough pig iron into Grangemouth for the week ending September 13 were 9,559 tons, being 6,719 tons over same week last year. Total decrease this year, 102,787 tons.

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R. FELDTMANN & Co. (Glasgow) report:—

TUESDAY.—Our market has again taken a firmer turn, caused principally by the fear of labour difficulties. The price of Scotch warrants advanced from 49*s.* 6½*d.* to 50*s.* 10*d.*, closing last night at 50*s.* 8*d.* To-day there was a fair business done, in the forenoon at 50*s.* 7½*d.*, 50*s.* 7*d.*, 50*s.* 10*d.*, and 50*s.* 9*d.* cash, and the afternoon at 50*s* 9*d.* to 51*s.* 0½*d*, closing buyers 51*s.*, sellers 51*s.* 1*d.* cash. Scotch shipping iron is not much changed; the demand is moderate. Stock in Connal's Glasgow stores, 657,699 tons, being 4,606 tons decrease last week, or 279,367 tons decrease since December 31, 1889. Shipments last week amounted to 10,881 tons, against 9 439 tons during the corresponding week of last year. The number of furnaces in blast on the 15th inst. was 78, against 83 at the same date last year.

PIG IRON	No. 1 s.	d.		No. 3 s.	d.
Coltness, f.o.b. Glasgow	63	6		56	6
Gartsherrie, „	61	0		56	0
Langloan, „	63	6		56	6
Summerlee, „	61	6		56	0
Carnbroe, „ (ex store)	51	9		51	3
Monkland, „ (ex store)	51	6		51	0
Clyde, „	60	0		55	0
Quarter, „ (ex store)	51	6		51	0
Calder, Port Dundas	62	6		54	0
Govan, Broomielaw (ex store)	51	6		51	0
Glengarnock, Ardrossan	60	0		53	6
Eglinton, Glasgow (ex store)	51	6		51	0
„ Makers', f.o.b. Ardrossan	52	0		51	6
Dalmellington, Ardrossan, nom.	54	0		53	0
Shotts, Leith	63	0		57	6

CUMBERLAND AND NORTH LANCASHIRE.

BOURKE & Co. (Workington) report September 15:—

The market for Bessemer iron has been steady during the past week, and makers' iron has been done at from 56*s.* 6*d.* to 57*s.* 6*d.* Makers of steel rails are asking 5*l.*, but lower prices have to be taken to secure business. The price of coke varies from 19*s.* 6*d.* to 21*s.* per ton. Ore from 10*s.* to 11*s.* 6*d.*, according to quality. The stores have increased this week 22 tons, and from the beginning of the year decreased 134,254 tons.

	Stock in—	Tons
Sept. 13..	West Cumberland Storing Company	134.784
	North-Western Storing Company	70,253
	Hematite Storage Company	4,991
	Furness Railway Store	36,262
	Total..	246,290

The shipments of Bessemer and hematite pig iron and steel for the week ending September 13 were:—Pig iron, 6,970 tons; steel, 8,116 tons; total 15,086 tons.

R. FELDTMANN & Co. (Whitehaven) report Sept. 16:—

The West Cumberland market for hematite iron is steady. Here, too, the fear of difficulties with the miners prevents makers from entertaining business where delivery is wanted some time ahead. We quote, nominally, 58*s.* to 61*s.* for Nos. 1, 2, and 3 Bessemer, f.o.b. usual shipping ports. Business in hematite warrants took place during the week between 57*s.* 2*d.* and 58*s.* cash. To-day's transactions were at 58*s.* to 58*s.* 1½*d.* cash, and 58*s.* to 58*s.* 3*d.* a month, closing buyers 58*s.* 1½*d.* cash, and 58*s.* 3½*d.* a month, sellers 1*d.* per ton more. Stock in Cumberland and Barrow stores, 246,290 tons, being 210 tons decrease last week, or 134,567 tons decrease since December 31, 1889. Furnaces in blast in that district, 46. Shipments during last week were 6,970 tons of hematite pig iron and 8,116 tons of steel.

MIDDLESBOROUGH.

W. MIDDLEMASS & Co. report:—

TUESDAY.—CLEVELAND PIG IRON.—The market was firm to-day, and a large business was done at 47*s.* per ton for No. 3 G.M.B., for prompt and forward delivery. At the close there were buyers over at this price, with sellers at 3*d.* to 6*d.* per ton more. Warrants are 47*s.* 7½*d.* cash buyers. Connal & Co.'s stock is now 90,855 tons; increase to-day, 37 tons; increase this month to date, 54 tons. HEMATITE PIG IRON.—Mixed Nos. are 57*s.* per ton f.o.b., sellers. MANUFACTURED IRON.—We quote: Plates, 6*l.* 5*s.*; angles, 6*l.*; bars, 6*l.* 2*s.* 6*d*, f.o.t. at works, less 2½ per cent. The shipments of pig iron from Middlesborough to date were 40,919 tons, against 33,636 tons last month, and 36,061 tons last year.

BELGIUM.

OSCAR MOENICH & Co. (London) report September 17:—

The price of "Sohier & Cie. Exp." nailrods remains unchanged at 5*l.* 17*s.* 6*d.* per ton net, f.o.b Antwerp, when No. 1 quality bars are still sold by re-sellers at about 5*l.* 2*s.* 6*d.* net, f.o.b. Antwerp, which is 5*s.* 6*d.* per ton under most makers' quotations. The demand for "Double-horse" steel is active at the syndicate price of 11*l.* 2*s.* 6*d.* per ton for ⅝ inch to 1 inch in cases or kegs. German wire nails are in good request at 8*s* 3*d.* to 8*s.* 6*d.* per cwt., and window-glass at 8*s.* 2*d.* to 8*s.* 6*d.* for ordinary Chinese assortments.

CHINA.

Mr. ALEXANDER BIELFELD (Shanghai) reports Aug. 8:—

There are no indications of a better state of things in the import trade at present. The demand for metals this summer is less than it was for many years past, and the position is made all the more serious from the fact that importations and stocks are far beyond ordinary requirements. LEAD.—50 tons L.B. spot have been placed at 4 tls. and 100 tons of the same chop, August and September shipment, at 3.85 tls. Spot remains asked for, while futures are not wanted at present. PIG IRON.—Common brands are in some demand at quotations. NAILROD IRON.—A sale of 10,000 bundles Belgian is reported at 1.80 tls. There are no sales of Sohiers on record this week. BAR IRON.—An invoice of 200 tons Scotch is reported done at 2 tls. IRON WIRE has fully dropped 10 cands. in value. Stocks are heavy but almost entirely in native hands. OLD IRON has been moderately steady during the week, with a little more business among native dealers. Sales of any consequence are not reported. TINPLATES are without change. STEEL.—500 boxes Anchor chop have been sold at 3.45 tls. SPELTER.—No business. STRAITS TIN has further declined in value, and sales are now making at 24.50 tls. for Fok-chok, and 24.20 tls. for Sow-kong. COPPER AND YELLOW-METAL SHEATHING.—I have heard of no contracts under this heading. Native holders are meeting with but a very moderate demand for their goods. JAPAN COPPER is again lower, and now selling at 14.50 tls. to 14.75 tls. KEROSENE OIL.—There is a moderate business doing among natives at 1.37½ tls. to 1.38 tls. for Devoes; and 1.32½ tls. for Russian. WINDOW-GLASS.—Stocks and goods to arrive shortly are ample.

IRON, METALS, &c.

T. W. & J. WALKER (London) report on September 17:—

COPPER.—Quiet: 61*l.* 7*s.* 6*d.* to 61*l.* 15*s.* for spot G.O.B.'s; strong sheets, 73*l.* to 74*l.*; yellow-metal, 6½*d.* TIN.—*Firm*: Straits, 99*l.* 5*s.* to 99*l.* 15*s.*; Australian, 99*l.* 7*s.* 6*d.* to 99*l.* 17*s.* 6*d.*; English ingots, 101*l.* 10*s.* LEAD.—Firm: Spanish, 13*l.* 15*s.* to 13*l.* 17*s.* 6*d.*; English, 14*l.* to 14*l.* 2*s.* 6*d.*; sheet, 14*l.* 15*s.*; shot, 17*l.* QUICKSILVER, 10*l.* 7*s.* 6*d.* ANTIMONY, 74*l.* SPELTER, 25*l.* SHEET ZINC, 27*l.* 10*s.* TINPLATES.—Market active: cokes, 15*s.* 6*d.*; charcoals, 17*s.* 6*d.* GALVANISED IRON.—Market keeps very steady. We quote ordinary 24-gauge, in bundles, 13*l.*, f.o.b. Liverpool. STEEL FENCING-WIRE, 7*l.* 10*s.*

COPPER.

HARRINGTON & Co. (Liverpool) report on September 17:—

Chili copper charters for the first half of September are advised as 2,000 tons fine. The total charters since January 1 have been 18,700 tons, against 16,400 tons for same time last year. Since our last the market is again stronger, with good business done in cash, short, and forward prompts, but chiefly in the two last; prices ranging from 60*l.* to 61*l.* 10*s.* cash, and 60*l.* 7*s.* 6*d.* to 62*l.* three months, closing steady at 61*l.* 7*s.* 6*d.* and 61*l.* 15*s.* respectively. The total increase during the fortnight in the Liverpool, Swansea, London, and Havre stocks is 1,750 tons. The present stock of English G.M.B.'s in warehouse, Liverpool and Swansea, is 3,888 tons, against 4,013 tons on 1st ult., showing a decrease of 145 tons. Refined and manufactured sorts are firm, quotations being:—English tough, 64*l.* to 65*l.*; best selected, 67*l.* 10*s.* to 68*l.* 10*s.*; India sheets, 70*l.* to 71*l.*; strong sheets, 73*l.* to 74*l.*; and yellow-metal sheets 6½*d.* per lb. The sales of furnace material comprise, at Liverpool, 500 tons argentiferous Montana matte, December shipment, sold at 11*s.* 7½*d.* per unit for copper, with 25 oz. silver per ton free; 113 tons English precipitate at 12*s.* 4½*d.*; 1,000 tons ordinary Anaconda (out of old stock) at 12*s.*; and 300 tons Boston Montana matte, to arrive, at 11*s.* 9*d.* At Swansea:—1,400 tons Namaqua ore, to arrive, at 11*s.* 6*d.*; and 1,500 tons Quebrada ore out of the Swansea stock, delivered by the Quebrada Company to the Cape Copper Company at 10*s.* 9*d.* per unit. It is reported that about 3,000 tons Cape Copper Company's best selected, mentioned in our report of August 1, have now been disposed of at 66*l.* per ton, this clearing out the accumulated stock which was held on French account. Import of Chili copper during the past fortnight, 834 tons fine, against 1,429 tons fine, same time last year; delivery, 834 tons, against 709 tons. Import of other copper during the past fortnight, 1,693 tons fine, against 3,764 tons; delivery, 1,405 tons, against 3,848 tons. The total imports of Chili and other copper into Liverpool and Swansea since January 1 have been 59,668 tons; deliveries during the same period, 84,935 tons fine; for same time last year the figures were 67,661 and 64,124 tons respectively.

LONDON PETROLEUM MARKET.

ARTHUR BROWN & Co. (London) report:—

MONDAY.—REFINED PETROLEUM OIL.—The market has been very quiet with only quite a limited business doing. Prime and standard white American sold at 5⅝*d.* to 5 7/16*d.*; Oct.-Dec., 5 7/16*d.* Russian spot, 5½*d.* to 5⅝*d.*, according to brand, prompt, &c.; Oct.-Dec. 5 7/16*d.* sellers. To-day's market closes quiet: American, spot, 5⅜*d.* to 5 7/16*d.*; Oct.-Dec., 5 7/16*d.* Russian, spot, 5½*d.* to 5⅝*d.*; Oct.-Dec., 5⅝*d.* to 5 7/16*d.* TURPENTINE has been quiet: spot has been steady at 30*s.* to 30*s.* 3*d.*; Oct.-Dec., 30*s.* 3*d.*; Jan.-April, 30*s.* 6*d.* to 30*s.* 9*d.* without much doing. To-day's market closes dull: short prompt, 29*s.* 9*d.*; Oct.-Dec., 30*s.* to 30*s.* 3*d.*; Jan.-April, 30*s.* 6*d.* to 30*s.* 9*d.* MINERAL LUBRICATING OILS.—Steady: English, Scotch, American, and Russian manufacture.—Black, 6*l.* to 14*l.*; amber, 6*l.* 10*s.* to 18*l.*; cylinder (black, filtered, amber, &c.), 8*l.* to 20*l.*

Turpentine.

	1890 AMERICAN	1889 AMERICAN
	Barrels	Barrels
Stock this day	10,825	2,398
Landed last week	1,658	217
Delivered last week	1,227	915

Above represents Stocks and movements at London Public Wharves.

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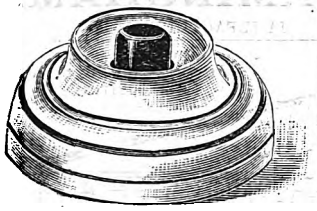
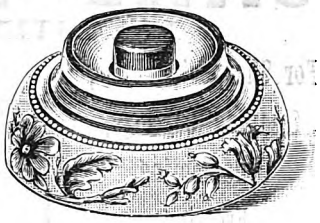
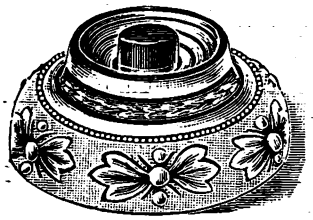
ELECTRICAL APPARATUS

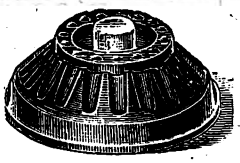


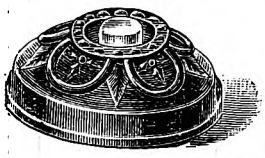
OF EVERY DESCRIPTION.

Bells, Batteries, Indicators, Pushes, Gas-Lighters.

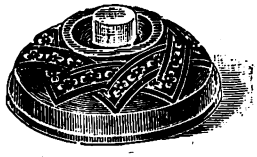


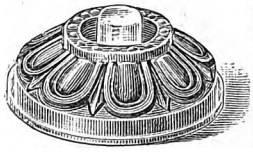


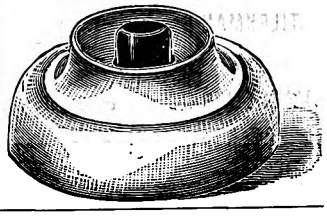




"DOMESTIC ELECTRICAL SUPPLIES," 110 pp., 1/-







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F

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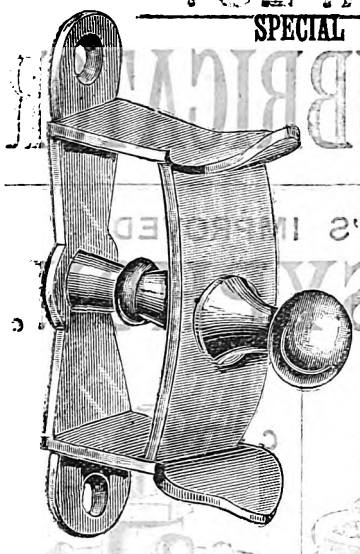
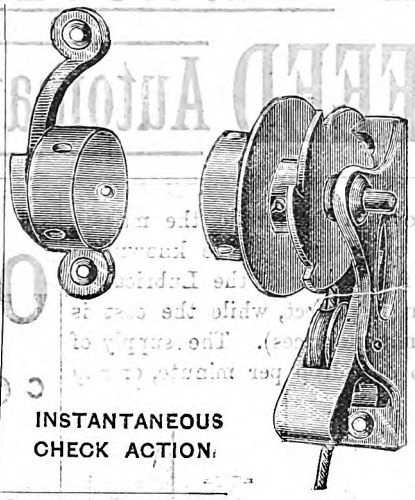
SANDERS, SON & PAYNE (LIMITED), LEOPOLD STREET, BIRMINGHAM.

SPECIAL LINES—

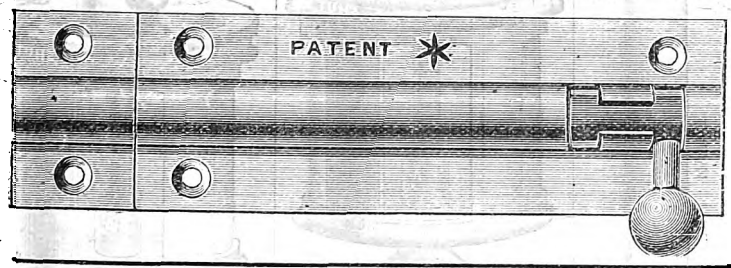


"THE R.U.R."
Patent Towel
or
Handkerchief
Holder.
The Rubber Clip holds the most delicate fabric without injury.
No. 2947.



INSTANTANEOUS CHECK ACTION.

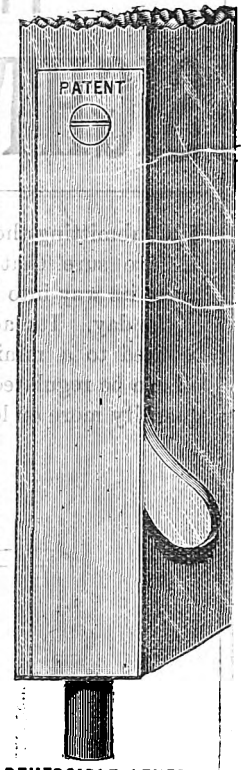
THE "STAR" PATENT MACHINE MADE BARREL BOLT.—No. 5399.



THE VICTORY PATENT BLIND ACTION.
No. 2378.

Revised Illustrated List of General Builders' and Cabinet Brassfoundry free on application.

THE "LEVER" PATENT MACHINE MADE FLUSH BOLT.—No. 5402.



REVERSIBLE LEVER.
Can be used for top or bottom of Door.

PATRONISED BY HER MAJESTY THE QUEEN.

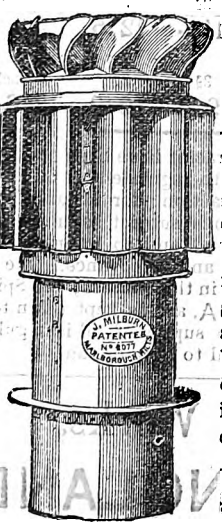
MILBURN'S

PATENT NOISELESS

REVOLVING CHIMNEY COWL,

NORTHUMBERLAND WORKS,

MARLBOROUGH



TRADE MARK.

THIS is the only Cowl as yet in the market which in ALL cases prevents wind blowing down Chimneys. It is almost impossible to say too much in its praise. Placed in most trying situations, it has never been known to fail. Great care is used in the construction of its internal fittings, which, being made of Copper and Brass, will last a long time. It is not at all liable to get out of order, and is made so strong that it will stand the force of a hurricane; in fact, increased action of a storm only increases its efficiency. It is perfectly noiseless; is easily swept—the shaft being free from obstruction to the sweep machine—the head cleansing itself. A heavy fall of snow does not impede its action, neither is it affected by frost. In case of the chimney taking fire it would remain uninjured, being made fireproof, and the oil-box requires replenishing with oil only once in six years.

SEVENTEEN THOUSAND IN USE.

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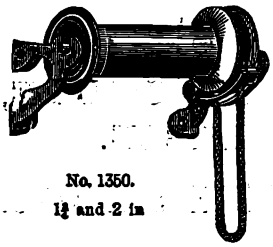
MAY & PADMORE,

BUILDERS' AND CABINET BRASS FOUNDERS.

Our No. 8 List, with Appendix, 156 pp., is now Ready. Write for a Copy.

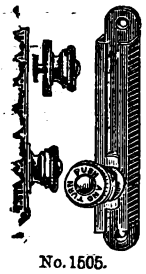


No. 1350.
1¼ and 2 in

25,000 SETS SOLD.

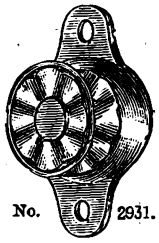
WINCHESTER'S PATENT
INDEPENDENT SPRING BLIND FURNITURE.

THE "GEM" RACK PULLEY.



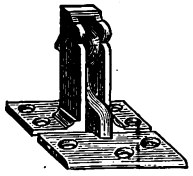
No. 1505.

SMITH'S PATENT CORD HOLDERS.



No. 2931.
Instantaneous Grip.

GARDNER'S PATENT SELF-CLOSING SASH FASTENERS.



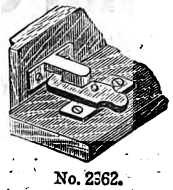
No. 7010.

Patent Solid Brass Machine-made SCREW COLLARS.

No. 0160.

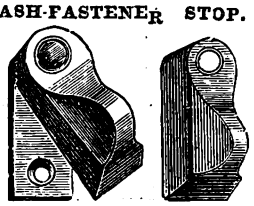
Sizes, 4 to 16.

RAYNER'S PATENT CUPBOARD CATCH.



No. 2362.

HOLLAND'S PATENT SASH-FASTENER & STOP.

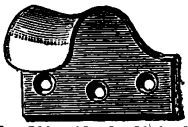


No. 2951.

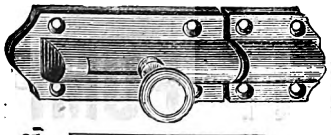
PATENT MACHINE-MADE FLUSH SASH LIFT.

No. 2318—3 3½ 3½ 4 inch.

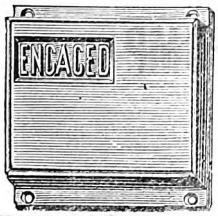
REGISTERED CONCAVE FRONT SASH LIFT.



No. 500.—1½ 2 2½ inch.

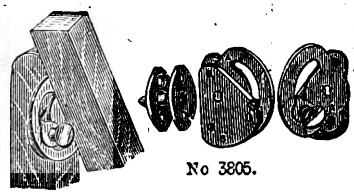


KING'S PATENT BOLT AND INDICATOR,



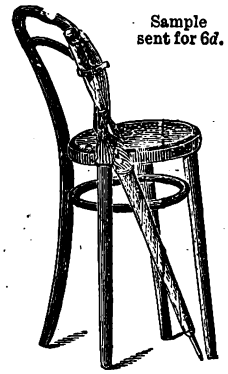
FOR OFFICES AND WATER-CLOSETS.

THE "RELIABLE"

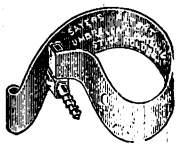


No 3805.

HALL'S PATENT
LOOKING-GLASS ACTION.



Sample sent for 6d.



½ Size.

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UMBRELLA
AND
WALKING STICK
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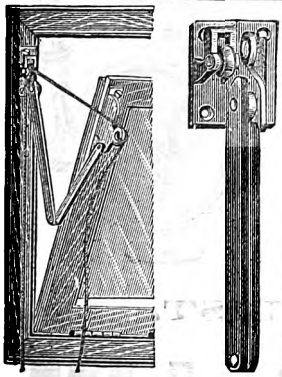
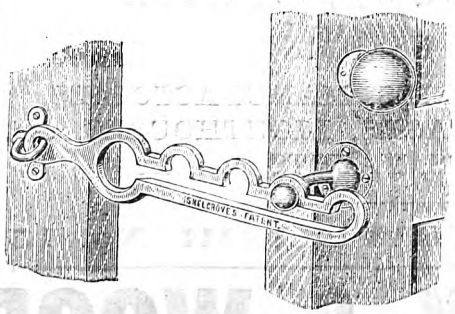
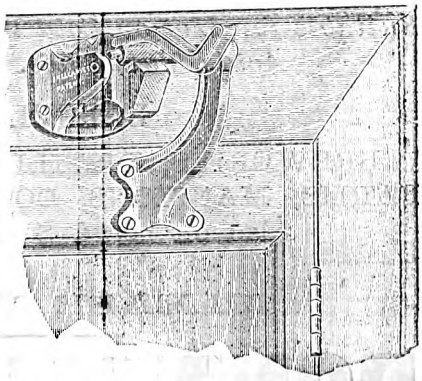


AUGUR'S PATENT FANLIGHT OPENER.
No. 3760.

This Door Chain cannot be unfastened from the outside.



SNELLGROVE'S PATENT DOOR CHAIN.



SNELLGROVE'S PATENT DOOR CHECK.

Works: 120, 121, 122, 123 Leopold Street, BIRMINGHAM.

ENGRAVINGS AND PRICES ON APPLICATION.

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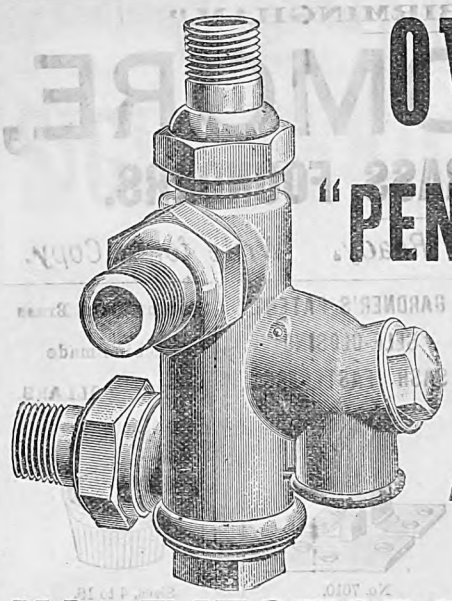

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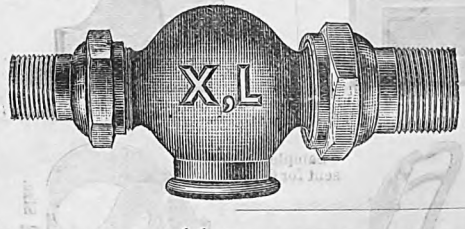

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WORKING PARTS OF GUN METAL.

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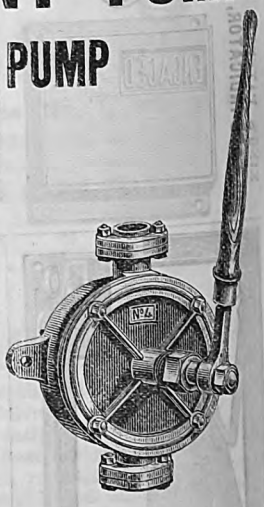

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Farringdon Works, Shoe Lane, LONDON, E.C.

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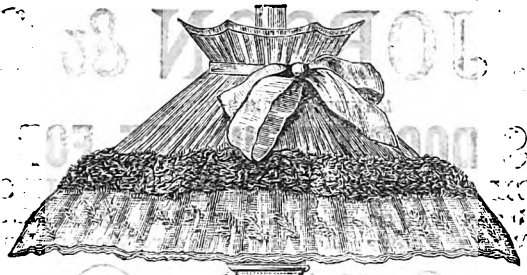
WILLIAM SOUTTER & SONS, Art Metal Workers, Chandelier Manufacturers, Coppersmiths, &c., &c., Farm Street Works, BIRMINGHAM.

PLAIN OXFORD.

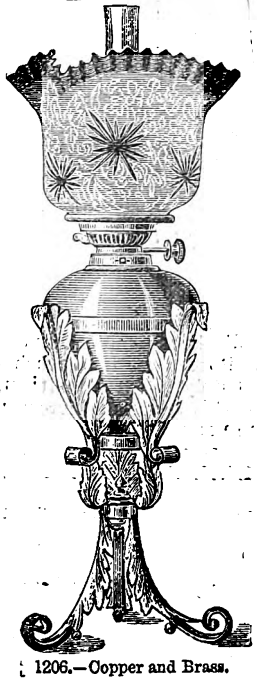
1172.

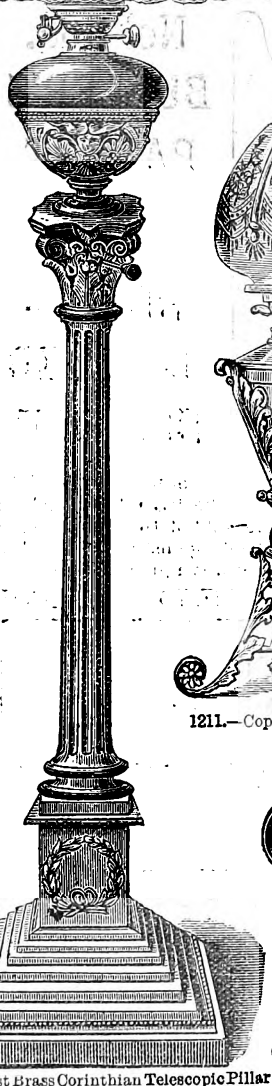


1169.

1060.

1177.

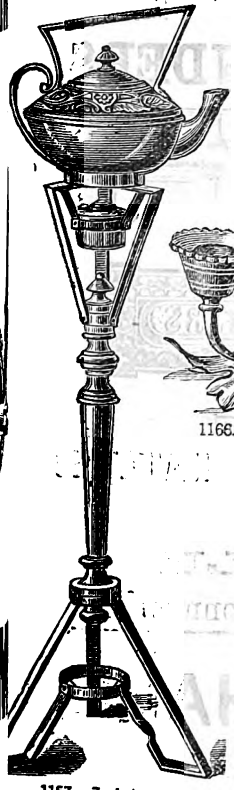

1206.—Copper and Brass.


Massive Cast Brass Corinthian Telescopic Pillar Lamp, rising to 8 feet.

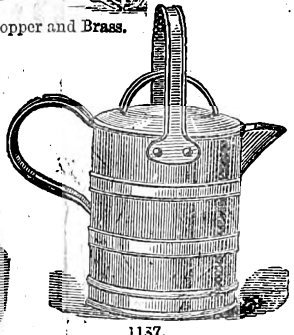
1211.—Copper and Brass.

1170.

1181.—3 pints. Plain.

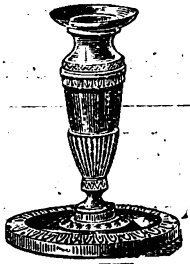

1153.—3 pints. Plain; Repoussé.

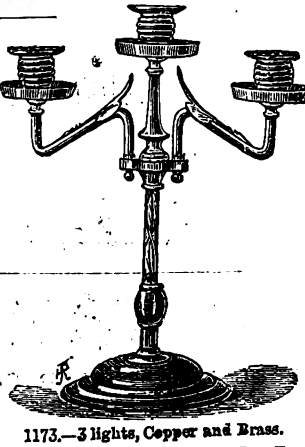
1166.—Copper and Brass.

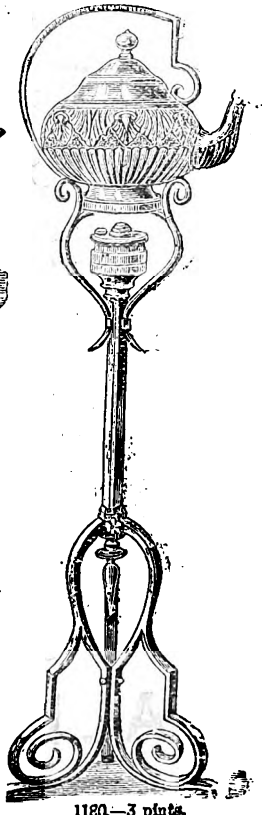

1157.
Copper and Brass Hot Water Can. 2, 3, 4, 5, and 6 pints.

All the above articles are made in Brass and Copper and Brass, and are covered with a Transparent Enamel, unaffected by Gas, Fly-specks, &c.
A large selection of novelties now on view for the coming season's trade.

1185.—Wrought-iron Stand.


LOUIS XIV.


1173.—3 lights, Copper and Brass.


1180.—3 pints. Plain; Repoussé.

NEW LONDON SHOWROOMS—47 HOLBORN VIADUCT, E.C. J. J. SMITH, Agent.

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BULLER, JOBSON & CO., Lim.

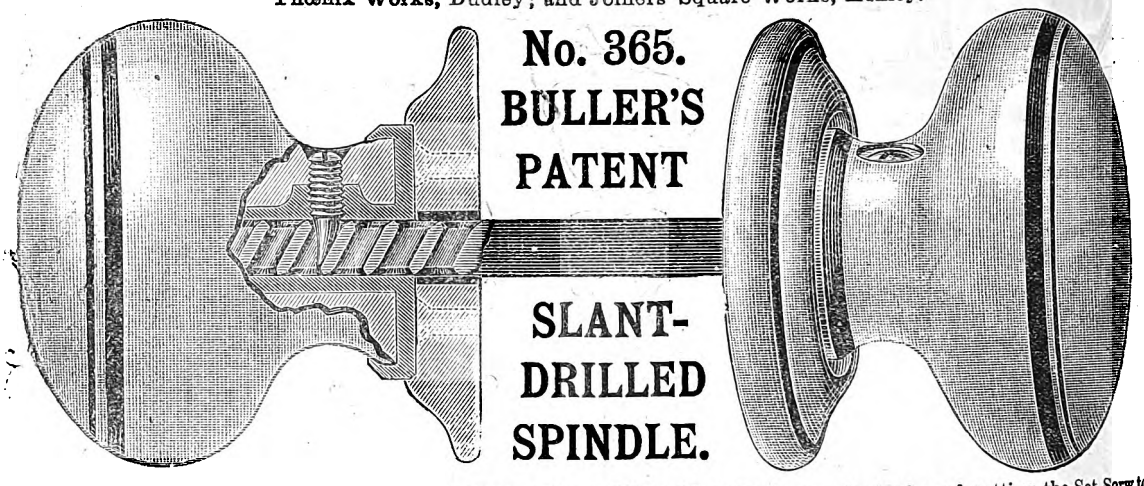
MANUFACTURERS OF

CHINA AND GLASS DOOR FURNITURE FOR ALL MARKETS,

SHERLOCK STREET WORKS, BIRMINGHAM.

London Offices and Show Rooms—32 & 33 QUEEN STREET, E.C.

Phœnix Works, Dudley; and Joiners' Square Works, Hanley.



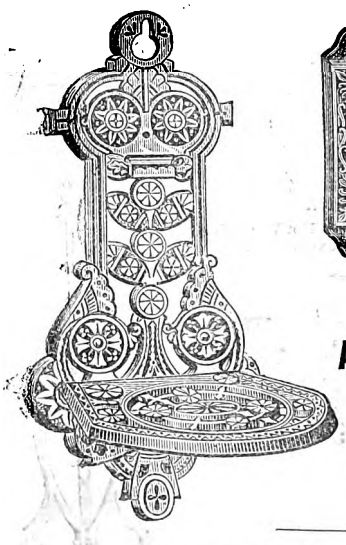
No. 365.
BULLER'S PATENT
SLANT-DRILLED SPINDLE.

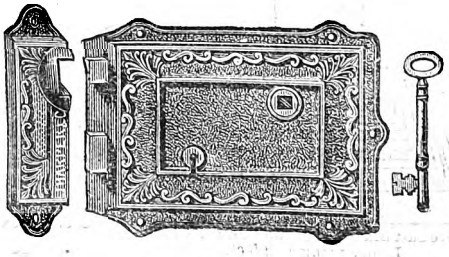
"Everyone who has ever tried to attach a Knob to an ordinary Wilkes' Spindle knows the bother of getting the Set Screw to properly enter its place in the Spindle. With the "Slant-Drilled" Furniture there is no such trouble. Owing to the improved construction, the Set Screw will take hold of the Spindle immediately in Any Position. When screwed home the fine taper point of the Screw is slightly bent against the "Slant," and this keeps the Screw from ever working loose. This furniture secures a great saving of Time and Trouble.

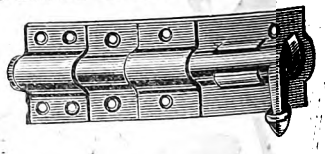
ONCE TRIED ALWAYS USED.

JOHN HARPER & CO., LIMITED,

GENERAL & MALLEABLE IRONFOUNDERS,







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OIL STOVES. CYCLES,

Locks, Latches, Door Bolts, Builders' Ironmongery.

ALBION WORKS, WILLENHALL.

FULL ILLUSTRATED CATALOGUES DIRECT ON APPLICATION.

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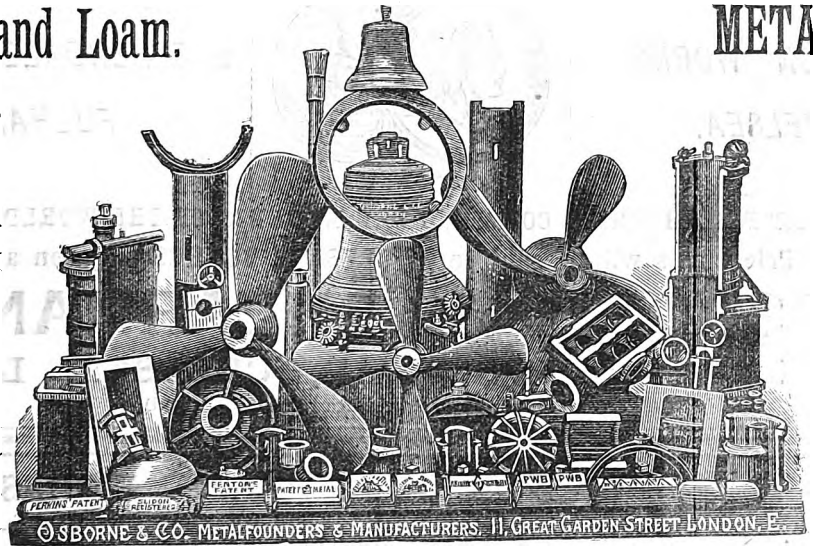
"TAYLOR'S SPECIAL"

HIGH-CLASS CASTINGS,
Sand and Loam.

FINEST ANTIFRICTION
METALS.



OSBORNE & CO.

11 GREAT GARDEN STREET, LONDON, E.

PHOSPHOR BRONZE

"SLIDON"

WHITE BRASS

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WAS MADE TO

THOMAS CHATWIN

VICTORIA WORKS, GREAT TINDAL STREET, BIRMINGHAM,

AT THE RECENT

MELBOURNE EXHIBITION,

FOR HIS EXHIBIT OF

STOCKS, DIES, & TAPS, SCREWING MACHINES,

PIPE CUTTERS AND WRENCHES, SPANNERS,

RATCHET-BRACES, RIMERS, & GENERAL ENGINEERING & GAS-FITTING TOOLS,

And the General Superiority of his Manufactures procured him the same honour at

ADELAIDE, 1887. STOCKHOLM, 1886. CALCUTTA, 1884.

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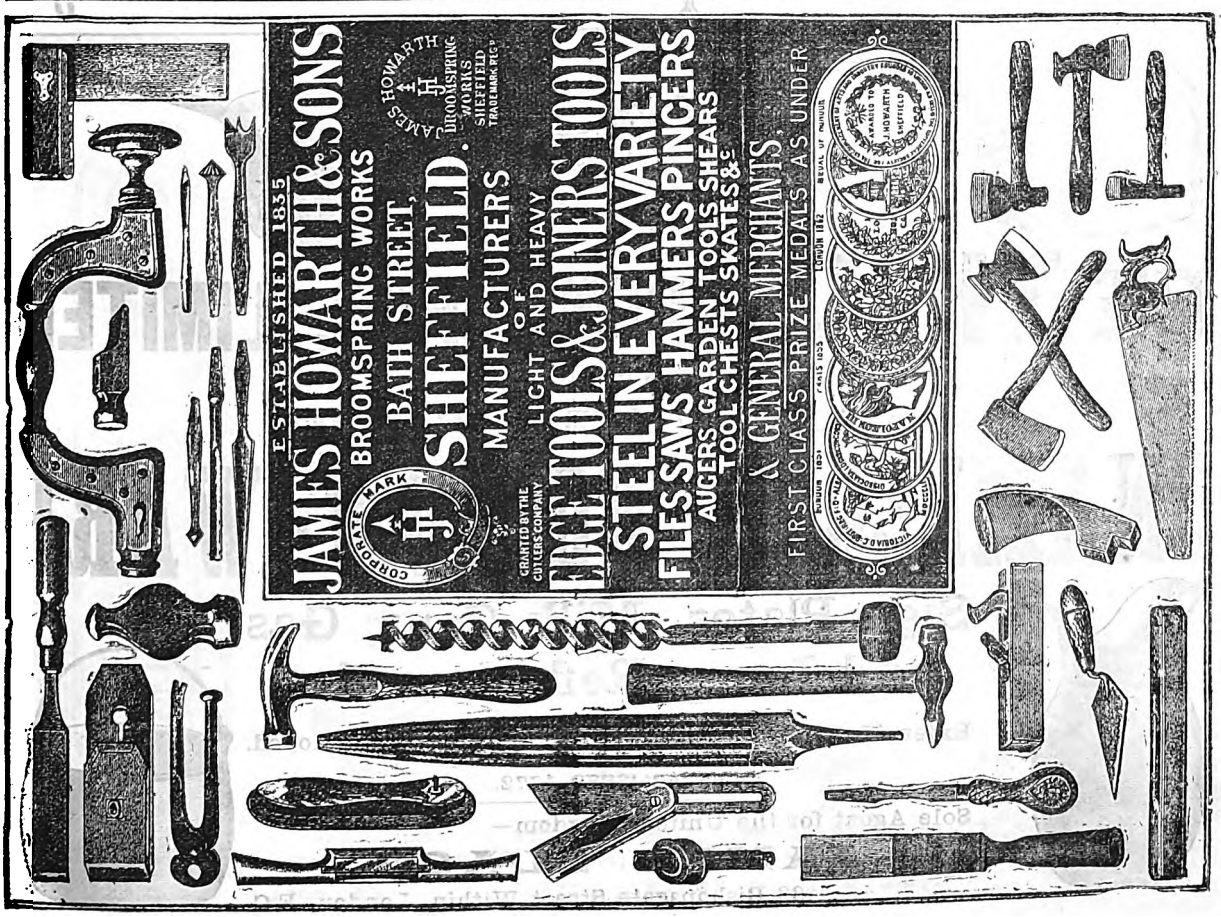
ESTABLISHED IN 1849, AND CELEBRATED FOR GOOD RELIABLE WORK.



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MANUFACTURERS OF

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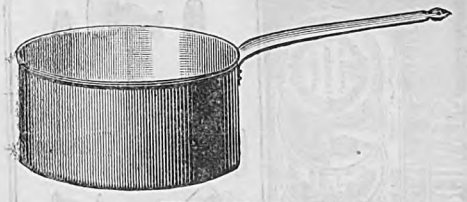
CURTAIN RINGS AND HOOKS,

AND

General Stamped Brassfoundry.



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MANUFACTURERS OF

WARRANTED STEEL STAMPED

ENAMELLED HOLLOW-WARE

Sign Plates, Milk Cans, Gas and Lamp Reflectors, &c.

Extensive Rolling Mills. 2,000 Hands Employed.

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BIRMINGHAM.

FIRST & SPECIAL AWARD,
MELBOURNE 1888.

Telegraphic Address—"TUBES BIRMINGHAM."

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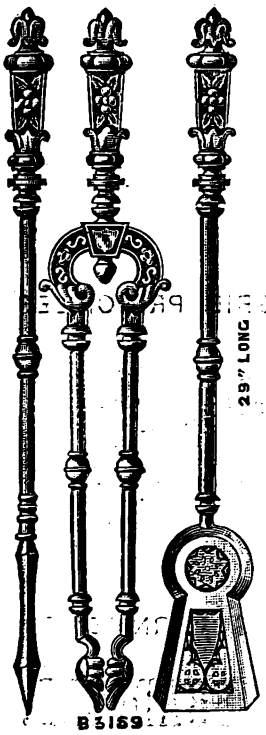
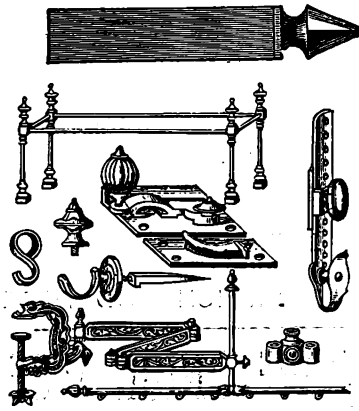
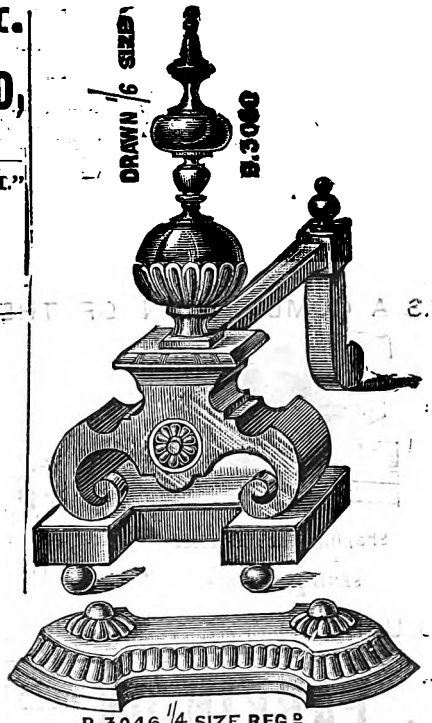
Telephone No. 425.

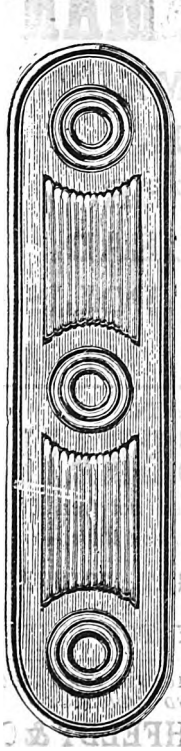


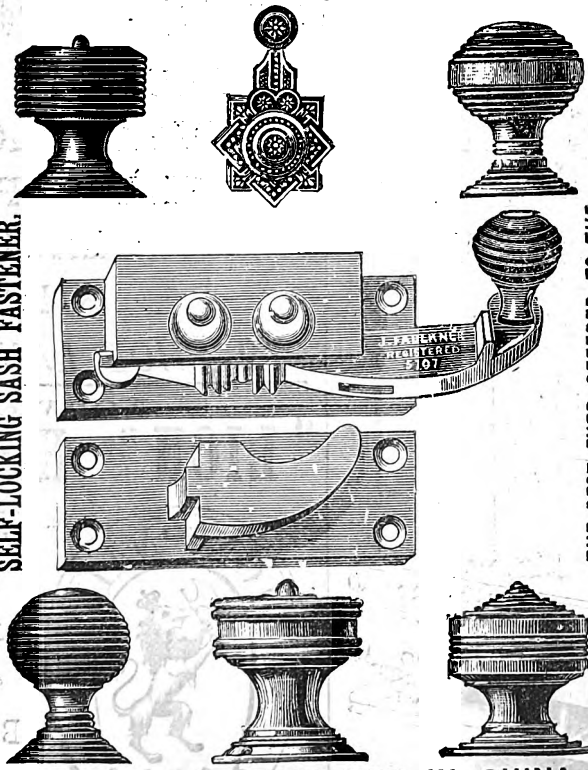


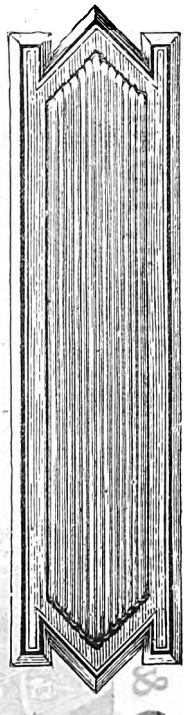


JULIUS FAULKNER, Patentee & Brassfounder, Omar Works, Clement St., BIRMINGHAM.

NEWLY DESIGNED REGISTERED CHINA FINGER PLATE.







NEWLY DESIGNED CHINA FINGER PLATE, REGISTERED.

MANUFACTURER OF LOCK DOOR FURNITURE IN CHINA, WOOD, AND GLASS,
AND ALL THE VARIED STYLES OF THE DAY.

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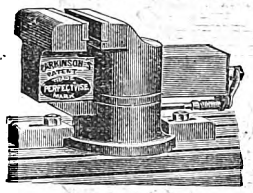
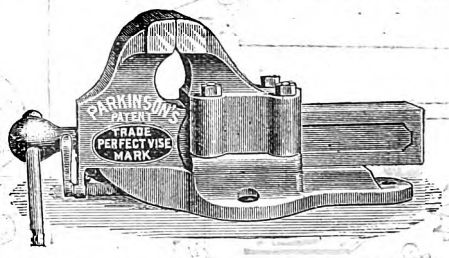
PARKINSON'S PATENT "PERFECT" VISE

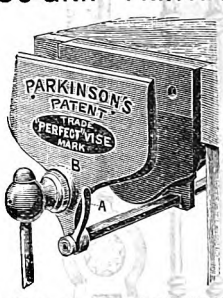
AS A COMBINATION OF THE SCREW AND INSTANTANEOUS-GRIP PRINCIPLES



Shaping Machine Vise.

SEND FOR LISTS.



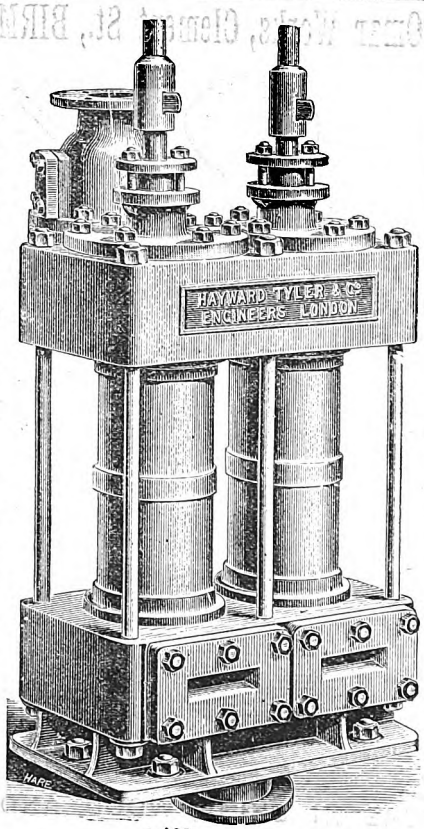


IS USED IN THE WORKSHOPS OF THE BRITISH AND FOREIGN GOVERNMENTS.

J. PARKINSON, GENERAL MACHINE MAKER, **UNION WORKS, BRADFORD.**

HAYWARD TYLER & CO.

90 & 92 Whitecross Street, LONDON, E.C.



463a.

ACTON & BORMAN'S

"GENUINE" EMERY.
EMERY CLOTH.
GLASS PAPER.
BLACK LEAD.
KNIFE POLISH.

72 SHOE LANE. LONDON.

NORWEGIAN

"LION" HORSENAILS.

Trade Mark.

Hammered Hot from Rods,—same as Hand Made,—not cut.

BRIGHT, POINTED, AND READY FOR DRIVING.

SOLE AGENTS FOR LONDON AND MIDDLESEX—

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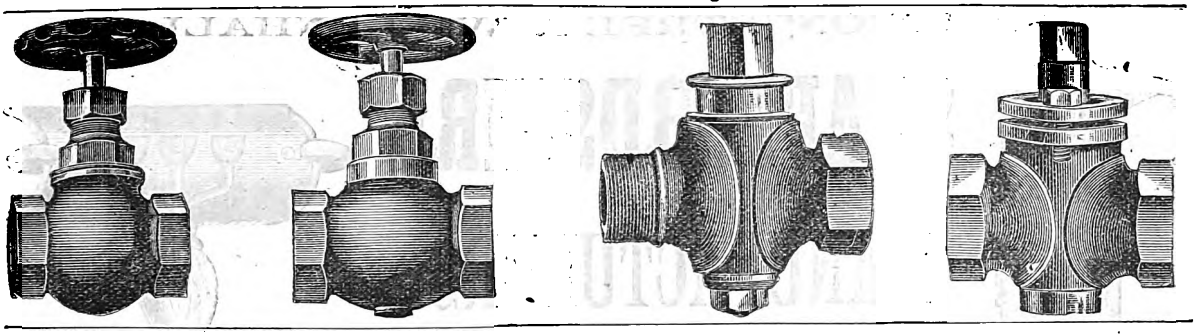
ISAAC STOREY & SONS, MANCHESTER.



NEW PATTERNS AND REVISED PRICES FOR

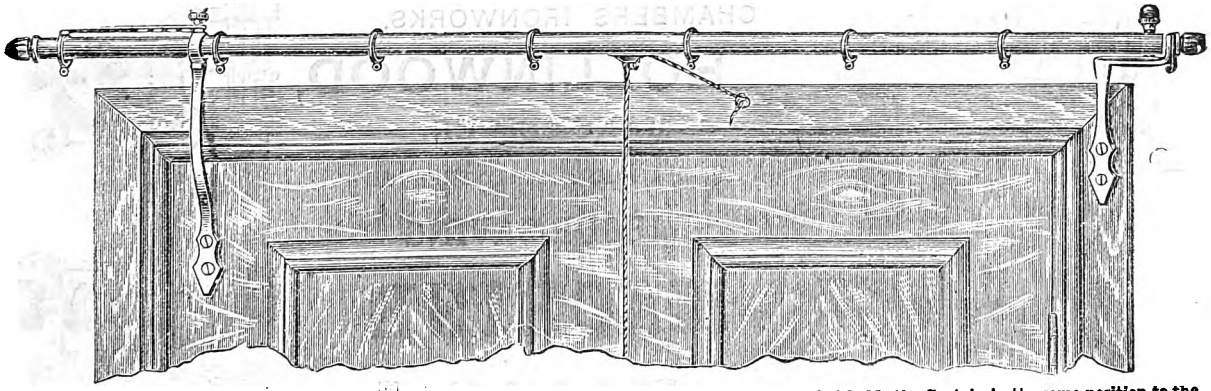
GUN METAL WHEEL VALVES,

MAIN AND GLAND COCKS.

Established 1837.

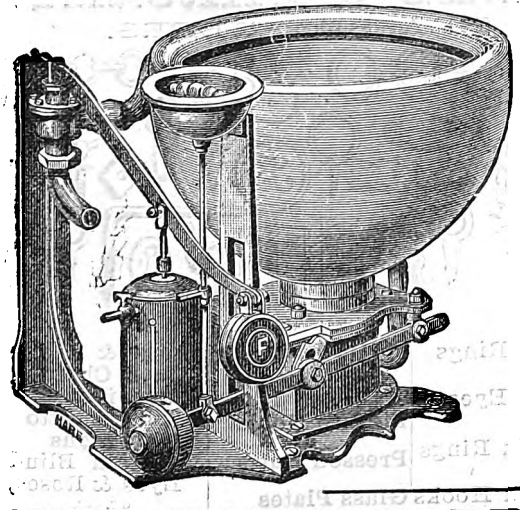
[1]

THE GARLAND PATENT CURTAIN DOOR ROD.



The ADVANTAGES over similar Curtain Door Rods are:—The Regulator attached to the Door Bracket holds the Curtain in the same position to the edge of the Door when open as when closed, allowing the Rod to travel by itself instead of carrying the Curtain, as is usual, making it difficult to get at the Knob or Handle of the Door. The other end of the Rod is pivoted in a manner that admits of the Curtain hanging *quite close to the wall*, without employing a Hinge Joint as in the common Rod. The Pulley arrangement in the middle of the Rod causes the Curtain to be raised as the door is opened resuming its position on the closing of the same.

Sole Manufacturers, WM. NEWMAN & SONS, Birmingham. London Depot: WM. CANE, 35 Snow Hill, E.C.



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ELASTIC VALVE CLOSETS,

Syphon Waste Preventing Cisterns,

NEW RIVER STAMPED FITTINGS,

And every description of Plumbers' Brass-work at Special Quotations.

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THE FALCON BRASS WORKS, LIMITED,

HOLLAND STREET, BLACKFRIARS, LONDON, S.E.

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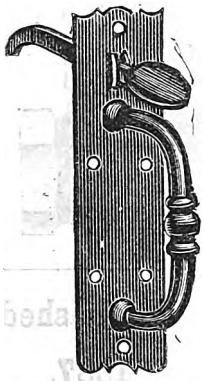
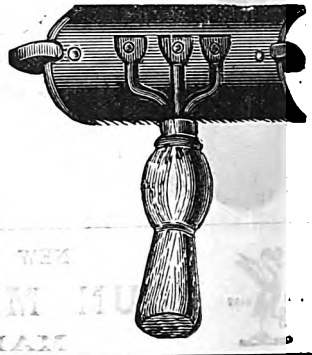
WAKELAM BROS.

38 UNION STREET, WILLENHALL,



STAFFORDSHIRE MANUFACTURERS.



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JAMES SPENCER & CO.

CHAMBERS IRONWORKS,

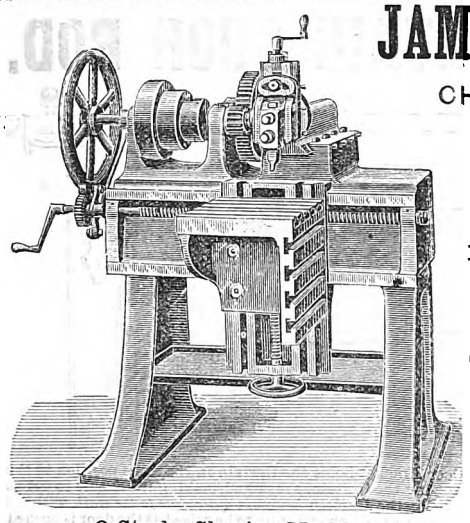
HOLLINWOOD,

MANCHESTER,

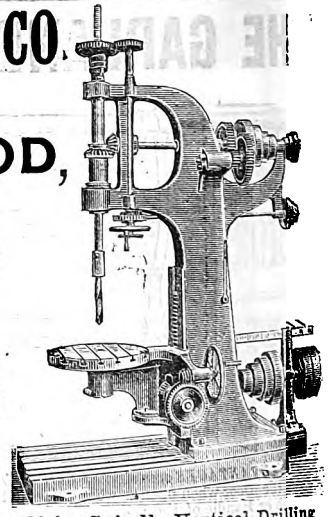
MAKERS AND PATENTEES OF

LABOUR-SAVING

MACHINE TOOLS. [6]



8-Stroke Shaping Machine.



2½-in. Spindle Vertical Drilling Machine.

TO ENGINEERS.

ESTABLISHED 1810.

COMMERCIAL BRASS FOUNDRY.

JOHN WEST,

BRASS & GUN METAL FOUNDER

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157 and 159 BACK CHURCH LANE,

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DEALER IN METALS.

Old Metals Bought or Taken in Exchange.

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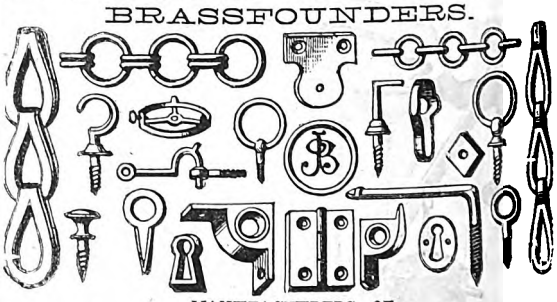
BRASSFOUNDERS.



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Screw Eyes	Picture Hooks	Galvanised & Tinned ditto
Curtain Rings	Pressed Butts	Escutcheons
Curtain Hooks	Glass Plates	Venetian Blind Eyes & Roses, &c. &c.

And all kinds of Stamped Brassfoundry.

2 CREGOE ST., BIRMINGHAM.

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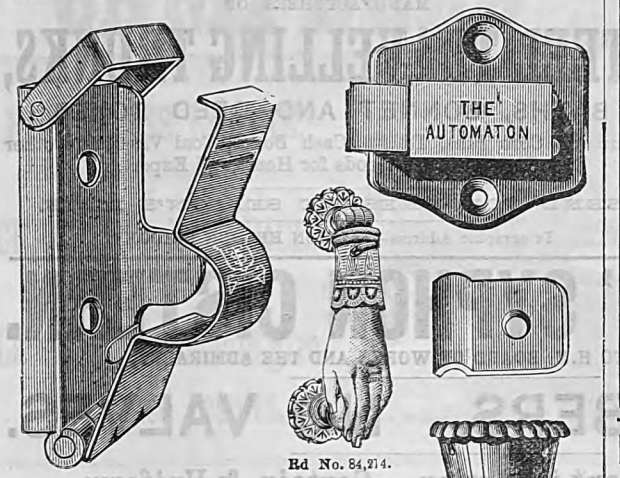
PATENTEES

CABINET, BUILDERS' & GENERAL BRASSFOUNDERS.



Rd No. 84,214.

REGISTERED.

Patentees and Sole Manufacturers of the

PATENT AUTOMATON DOUBLE-ACTION SPRING CATCH FOR PEDESTAL WARDROBES, CUPBOARD, & ALL KINDS OF DOORS

SIMPLEST, BEST, AND CHEAPEST IN THE MARKET,

Also of the Patent Rotary Castors, and Brackets for Muslin Curtains, Rods, and Bands and Rods.

Many Specialities in Cast and Stamped Cabinet Handles

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JOHN TANN'S RELIANCE SAFE

DOORS, LOCKS &c

NEWGATE ST

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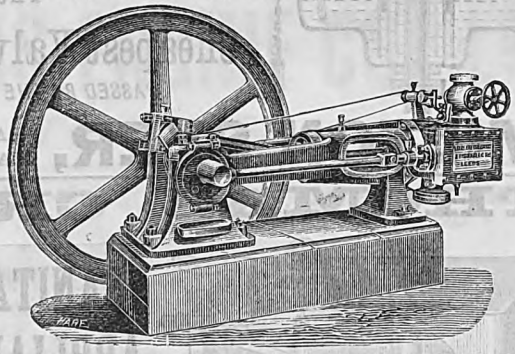
LEEDS ENGINEERING & HYDRAULIC CO.

MAKERS OF

WINDING, HAULING, AND PUMPING ENGINES,



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&c., &c.

Providence Works, Cross Stamford Street, LEEDS.

TELEGRAPHIC ADDRESS—"PUMPS LEEDS."

THOS. CLIVE & SON,

Established 1820.

BIRMINGHAM.

EVERY DESCRIPTION OF

Malleable Castings

FOR

Cycle Makers, Engineers, Machinists, Agricultural, Electrical & Domestic Machines, Boat Builders, Coach Builders, Brass Founders &c.

ALSO GENERAL IRON FOUNDERS.

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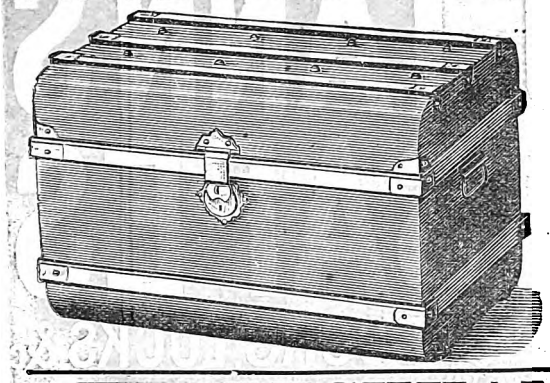
ABRAHAM UTTLEY & SONS



Albion and Hollins Tin and Japan Works,

HEBDEN BRIDGE, near MANCHESTER,

MANUFACTURERS OF

STEEL TRAVELLING TRUNKS,

BATHS, BONNET AND DEED BOXES,

Flour and Corn Bins, Toilets, Cash Boxes, Coal Vases, and other Tin and Japan Goods for Home and Export.

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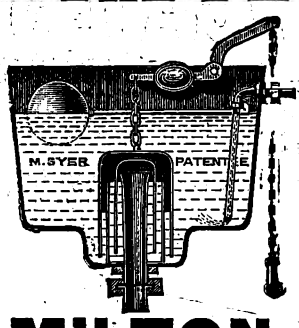
"THE PECKHAM" SYPHON CISTERN.

AS SUPPLIED TO H.M. BOARD OF WORKS AND THE ADMIRALTY.



NO RUBBERS. NO VALVES.

Simple & Silent in Action. Certain & Uniform.

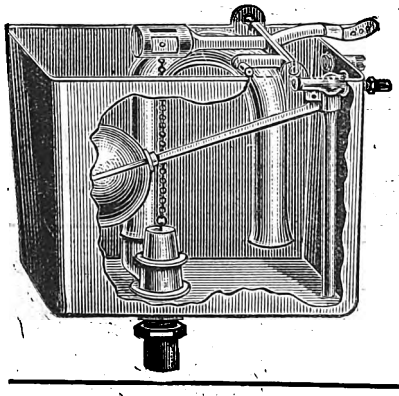
FLUSH OF TWO OR THREE GALLONS.

Cheapest Valveless Syphon Cistern in the market.

PASSED BY THE PRINCIPAL LONDON & PROVINCIAL WATER COMPANIES.

MILTON SYER, PATENTEE AND MANUFACTURER, 36 Rye Lane, PECKHAM, S.E.

THOMAS CRAPPER & CO.



SANITARY APPLIANCES.

Catalogues on application.

THOS. CRAPPER CO.

Marlboro' Works,

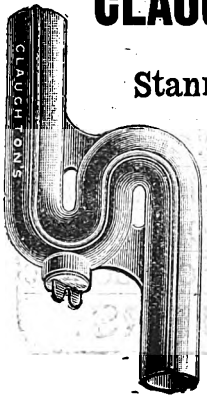
Chelsea, London, S.W.

[2]

CLAUGHTON BROTHERS

LEAD FOUNDERS,

Stanningley, **LEEDS,**



Beg to submit to your notice their new SYPHON TRAP, the 1½ in. being now ready. These Traps have a water-seal of 1½ in.; are cast in halves and burned solid together, therefore free from solder. They are made of the best virgin lead, are uniform in thickness, and equal to 8-lb. sheet, and as smooth inside as solid-drawn pipe; can be made with or without brass plug and lining. When made with plug, the lining is cast in the Trap in such a manner as to prevent it from turning round or drawing out.

PRICE, with BRASS PLUG, 2/3.

DISCOUNTS AND TERMS AS USUAL.

"JOHN" SMEATON, SON & CO.

56 GREAT QUEEN STREET, LONDON, W.C.,

SANITARY ENGINEERS.

PATENT COMBINATION

"Amphora" and "Nautilus" Closets.

Prices, according to finish, from £4 4s. [2]

Estimates for all kinds of Plumbing, Heating, Ventilating, Sanitary work free to the Trade.

LIST ON APPLICATION.

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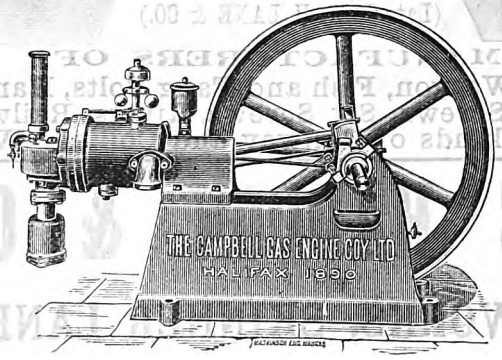
THE "CAMPBELL" GAS ENGINE

HIGH-CLASS ENGINE.

CHEAPEST IN PRICE.

Latest Improvements give unequalled results.



EASY MANAGEMENT.

EASY STARTING.

London Office—
18 DOCKHEAD, S.E.

Manchester Office—
3 TODD STREET.

SOLE MAKERS—

THE "CAMPBELL" GAS ENGINE CO., LD.

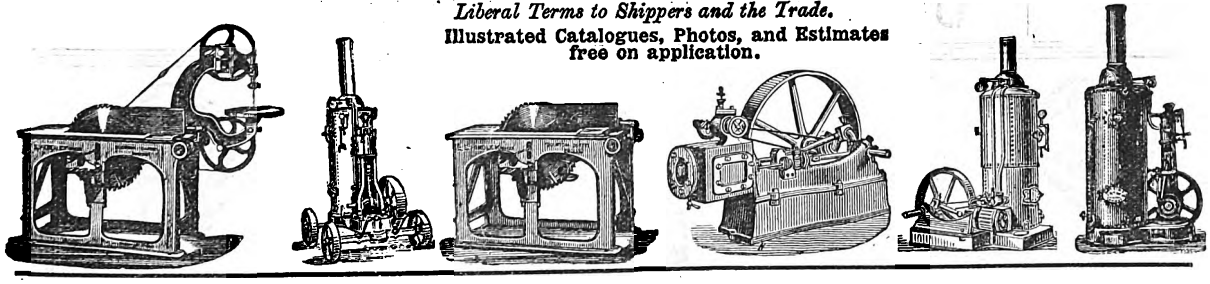
HALIFAX, YORKS.

E. S. HINDLEY,

LONDON SHOW ROOMS AND STORES,
11 QUEEN VICTORIA STREET, E.C.
WORKS—BOURTON DORSET.

VERTICAL STEAM ENGINES, Portable or Fixed.
HORIZONTAL STEAM ENGINES, with or without VERTICAL BOILERS.
SAW BENCHES, CIRCULAR AND BAND.

Liberal Terms to Shippers and the Trade.
Illustrated Catalogues, Photos, and Estimates free on application.



BRITISH ASBESTOS CO.

"PHŒNIX"

TRADE MARK.

10 DUKE STREET, ALDGATE, LONDON, E.C.

ALL KINDS OF ITALIAN & CANADIAN ASBESTOS GOODS.

Asbestos Fibre for Gas Fires. Asbestos Fuel for Gas Fires.

ALL KINDS OF COTTON AND SOAPSTONE, AND HEMP PACKINGS

ILLUSTRATED PRICE LIST FREE ON APPLICATION.

Special Terms to Shippers and the Trade. Specify "PHŒNIX" Brand.

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SAMS LANE AND WATTON ST. WORKS, WEST BROMWICH

ESTABLISHED 1854.

WEST BROMWICH BOLT AND NUT Co

(Late JOSIAH LANE & CO.)

Telegrams—"BOLTS" WEST BROMWICH.

LONDON OFFICE— 86 Leadenhall Street, E.C.

AGENTS— MESSRS. EDWARD LE BAS & CO.

MANUFACTURERS OF

Best Engineers', Coach, Waggon, Fish and Fang Bolts, Hand and Machine Made Nuts, Bolt Ends, Coach Screws, Set Screws, Rivets, Railway Spikes, Washers, and all kinds of Railway and Colliery Work.

THOMAS HADDON & CO.,

GLOBE WORKS, SKINNER LANE,

BIRMINGHAM.

REGISTERED CROWN

HAWKINS & CO.

CROWN FOUNDRY,

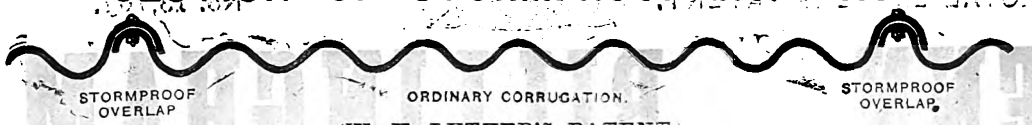
DUDLEY PORT, TIPTON.

TRADE MARK REGISTERED

MANUFACTURERS OF

Frame and Axle Pulleys, Charcoal Box Irons, Sad Irons, Iron Stands, Trivets, D Traps, Weights, Boiler Doors and Frames, Oven Doors and Frames, Air Bricks, Signal Pulleys, English and Foreign Weights, Wall Ties, the necessary Castings for Spring Mattresses, Dumb Bells (Octagon Pattern) and all kinds of Heavy Castings, and Castings for Gas and Water Engineers—as Valves, Water Boxes, Street Hydrants, &c., &c.

SECTION OF STORMPROOF ROOFING.



(W. H. LUTHER'S PATENT.)

THE

PATENT "STORMPROOF"

ROOFING SHEETS

Have been designed to meet the only defect that has been alleged against Corrugated Iron for Roofs—viz., an overflow of rain at the side laps. Hitherto some Engineers have tried to guard against this very serious **danger to the goods beneath** by stipulating for an overlap of two corrugations instead of one. This not only added 12½ per cent. to the cost of the Roof, but was not an effectual remedy. From the annexed Section and Drawing it will be at once apparent that **an enormous volume of Water can be carried over the Roof without overflowing the Stormproof side corrugation.** It also adds to the **strength** and **appearance** of a Roof.

To ensure adoption it is of importance to insert in Specification, "Roofs to be covered with Braby's Galvanized Corrugated Iron Stormproof Sheets."

F. BRABY & CO., Makers,

LONDON—352 to 362 Euston Road. **GLASGOW—Eclipse Iron Works.**
LIVERPOOL—8 Hatton Garden.

IRON AND STEEL

BIRMINGHAM OFFICES: COUNTY CHAMBERS CORPORATION STREET

REGISTERED TELEGRAPHIC ADDRESSES: STRINGER WESTBROMWICH STRINGER BIRMINGHAM

STRINGER BROTHERS

ALBION,
WEST BROMWICH,
South Staffordshire.

OVER FIVE THOUSAND TONS

S. B. IRON & STEEL

Branded Bars, Plates, Sheets, Hoops, Angles, Tees.

And Fullered Horseshoe Iron, all Sections and Sizes, in Stock from which

ORDERS CAN BE EXECUTED ON RECEIPT.

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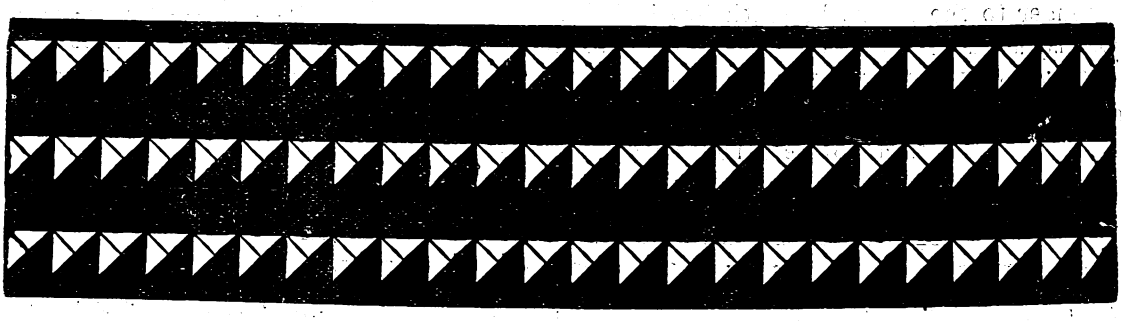
BY ROYAL LETTERS PATENT. No. 13,767.

PENN & BILLINGHAM'S

PATENT WROUGHT-IRON

STEP PROTECTOR



Used by all the Principal Tramway, Omnibus, and Railway Companies throughout the United Kingdom.

Warranted to wear longer than any Step Protector used, and 50 per cent. Cheaper.

Will Weld or Bend to any required shape. Can be made any length up to 30 feet.

FOR PRICES AND PARTICULARS APPLY TO

JOSEPH BILLINGHAM, JUNR.,

CRADLEY HEATH, STAFFORDSHIRE.

JOSEPH BILLINGHAM, JUNR.,

CRADLEY HEATH,

STAFFORDSHIRE,

MANUFACTURER OF EVERY DESCRIPTION OF

NAILS, CHAINS, CABLES, &c.,

Incline Crane and Rigging Chains, Coil Chains, Back Bands, Cart and Plough Traces (Improved Pattern), Single and Double Link Van Traces, Hames, Buckles, Manger, Rack, Check, and Pillar Chains; also every description of

CART GEAR WORK,

Skid and Tail Board Chain, Lock and Pole Chains; and all kinds of

COACH IRONMONGERY;

also Ironwork of every description for all purposes.

JOSEPH PENN & Co.

PROVIDENCE IRON WORKS,

CRADLEY HEATH, STAFFORDSHIRE,

MANUFACTURERS OF

Small, Rounds, Squares, Flats, Half-Rounds, Ovals, and Fluted Iron, &c., in

Best, Best Best, and Treble Best qualities.

ALSO

"SPECIAL" BEST BEST PULLEY-BLOCK CHAIN IRON.

ESTABLISHED 1859.

PENN BROTHERS,

PROVIDENCE ENGINEERING WORKS,

CRADLEY HEATH, STAFFORDSHIRE

HYDRAULIC,

SANITARY, and

GENERAL ENGINEERS,

IRONFOUNDERS, ETC.

ESTABLISHED 1839.

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HIGHLY RECOMMENDED BY SANITARY AUTHORITIES.

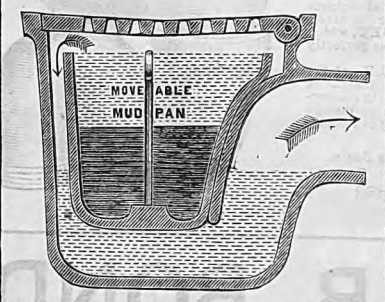
NONE CHEAPER.

William Cross & Son,

SOLE MANUFACTURERS OF

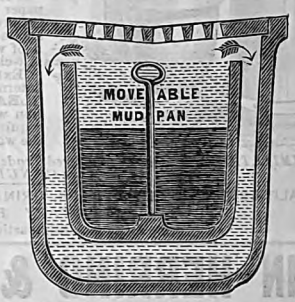
CARTWRIGHT'S PATENT No. 7061,

SECTION 1.



SELF CLEANSING STENCH TRAP.

SECTION 2.



LYNG IRON FOUNDRY, WEST BROMWICH.

NONE BETTER.

SEND FOR TRADE LIST AND MODEL, FREE ON APPLICATION.

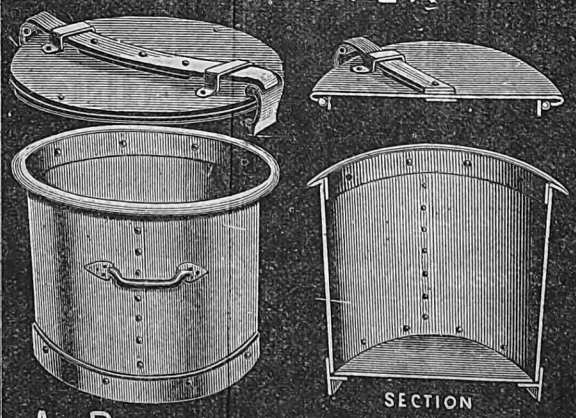
PARKINSON & SWEANEY (late A. Parkinson & Co.)

PARKINSON & SWEANEY'S

IMPROVED PATENT

SANITARY RECEPTACLE AND COVER

THIS Patent Sanitary Receptacle and Cover supplies a perfectly air-tight vessel for the removal of town refuse, a necessity which has long been acknowledged by municipal and urban authorities. The Cover of the Sanitary Receptacle is rendered air and water tight by means of an indiarubber tube fixed round the flange of the lid, and is pressed down and secured on the edge of the vessel by ordinary spring bars, as shown in the annexed figures. In order to reduce the wear of the bottom of the vessel to a minimum, it is protected and held firm by a strong T iron hoop; the projecting flange of which supports the bottom, the upper flange being riveted to the body of the Receptacle; the top of which is also well protected by a strong welded angle-iron hoop.



SECTION

The hoop being taper and fitting into, "not outside the Receptacle, also taper in form," adds materially to the strength and durability of the article.

Upwards of 150,000 of these Receptacles have been supplied to, and are being now used by, the Manchester, Salford, Pendleton, Bury, Bolton, Oldham, Bradford, Wakefield, Northwich, Darwen, Dublin, and Glasgow, and many other local boards and urban authorities, whom Messrs. A. P. & Co. give as references as to the strength and workmanship of their goods. These Receptacles are made from sheet iron, or sheet steel, as preferred, and galvanised after being made. Messrs. A. Parkinson & Co. will quote for any given size in any shape.

[2]

A. PARKINSON & CO.

UNION STREET, GREAT ANCOATS, MANCHESTER.

SOLE MANUFACTURERS,

AND MAKERS OF ALL KINDS OF GALVANISED SHEET IRON GOODS

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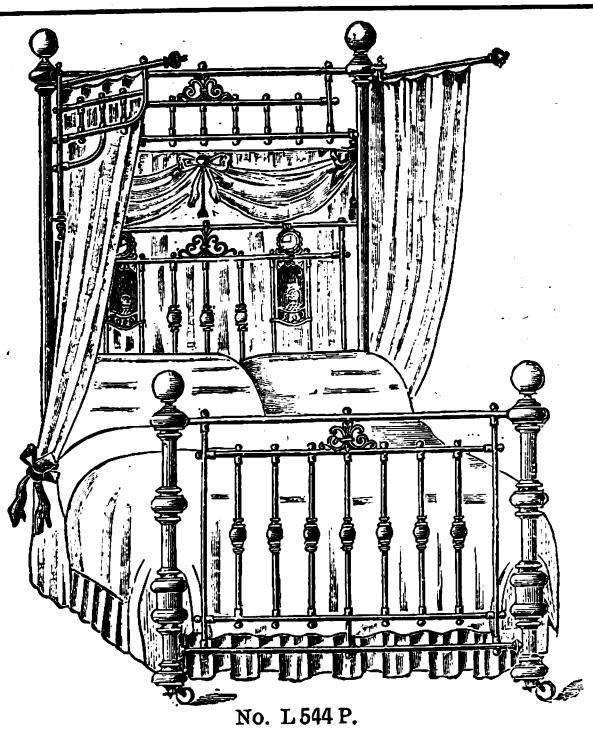
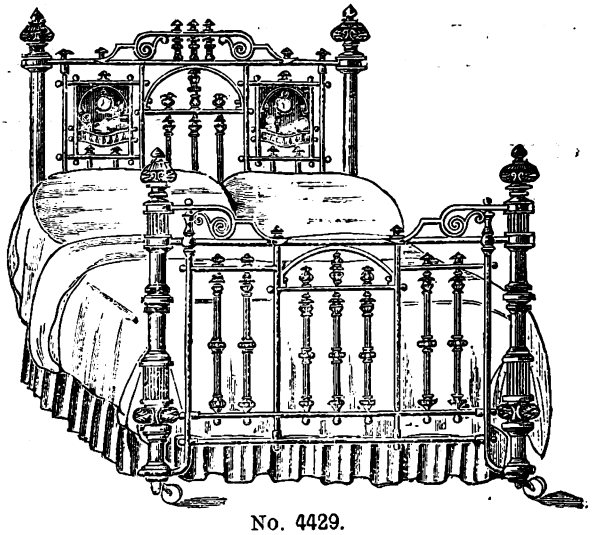
WINFIELDS

PATENT TRINKET-POCKET BEDSTEADS.



No. L 544 P.



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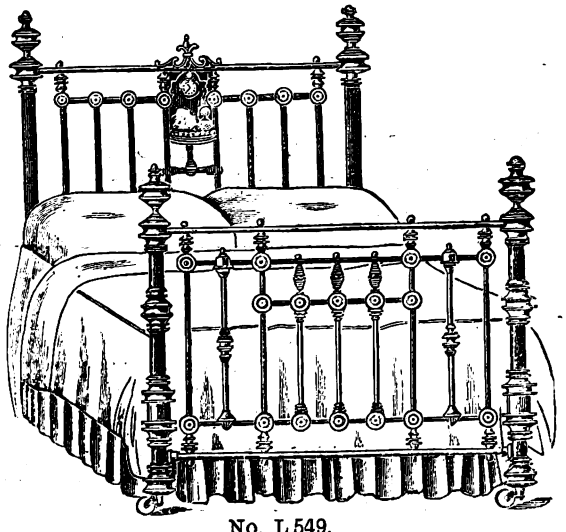
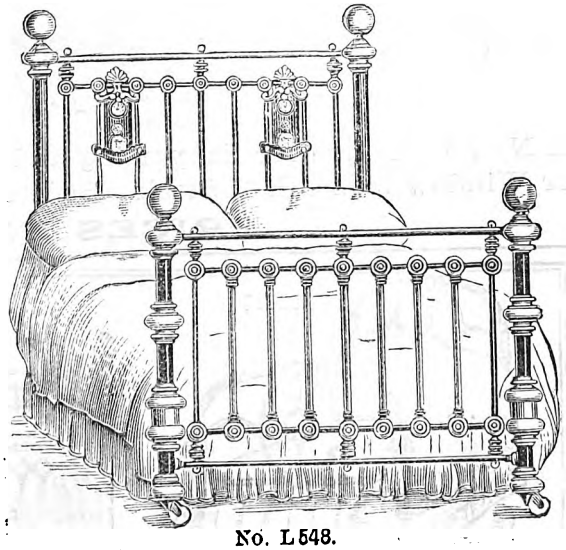


No. L 549.



No. L 548.

WINFIELDS LIMITED

Desire to call the special attention of the Trade to this useful novelty, which, while making the Bedstead more attractive, supplies a long-felt want. The old-fashioned Upholstered Bedsteads have bags, but they are unsightly and of very little use. With the ordinary French Bedsteads there are no conveniences for hanging a watch, placing a scent-bottle or pocket-handkerchief, or a medicine-bottle in case of sickness. Our Patent Pocket or Bedstead Tidy supplies these deficiencies. The drapery can be easily removed, and may be replaced at any time with little cost.

Brass or our Patent Black and Brass Bedsteads, either French, Half Tester, or Persian, can be made with Pockets, and samples may be seen at the

Works, CAMBRIDGE STREET, BIRMINGHAM, or at the LONDON SAMPLE ROOM, 49 FARRINGDON STREET, E.C.

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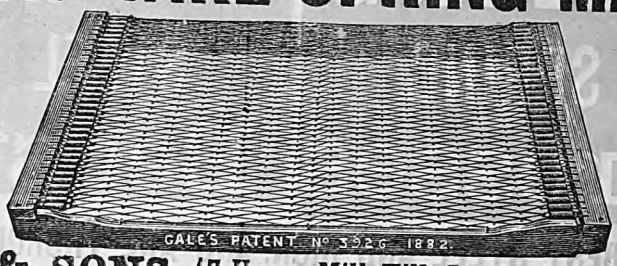
AWARDED PRIZE MEDAL, PARIS EXHIBITION, 1889.

"DOMINION" WIRE SPRING MATTRESS

Guarantee given to all Dealers binding us to replace free of expense, in case of failure of any part within 15 years.



PORTABLE.

Two packed in case for Shipment measure 5 cubic feet.

The Trade and Shippers—Write for Price List, Testimonials, &c.

GEO. GALE & SONS, 17 Upper Mill Hill, Leeds, & Waterville (P.Q.), Canada

Telegraphic Addresses:—"DOMINION LEEDS," "GALE WATERVILLE CANADA."

For Spring **BEDSTEADS** fitted with **DOMINION** Mattresses apply as below.

THE "LAWSON TAIT" BED

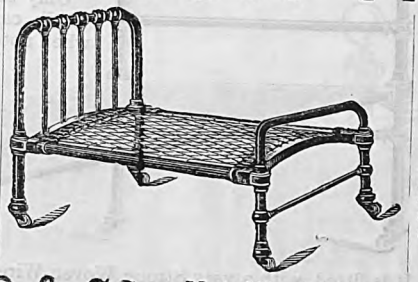
SPRING BEDSTEADS

For Hospital & General Use.

METALLIC BEDSTEADS

&c., of all kinds, for all Markets.

New Pattern Book, with Prices, Illustrations, Testimonials, &c., post free.



AFTER SIX YEARS' WEAR.

7 The Crescent, Birmingham,
June 25th, 1888.

Messrs. S. B. Whitfield & Co.

Dear Sirs,—The Bedsteads you constructed for me with "Dominion Wire Spring Mattresses" are by far the very best I have ever seen for Hospital use. They have now been *in use for over six years, and have not given way in the least; the Springs have never broken, nor do they get rusted. They are in every way satisfactory.*

Yours truly,
LAWSON TAIT, F.R.C.S.

S. B. WHITFIELD & CO., Metallic Bedstead Manufacturers, Birmingham

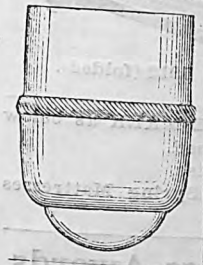
LONDON OFFICE—58 HOLBORN VIADUCT, E.C.

Telegrams:—"BEDSTEADS BIRMINGHAM."

THE SHEFFIELD CASTORS

PATENTS No. 172 and 13697.

No. 2.
SCREW CUP CASTOR.



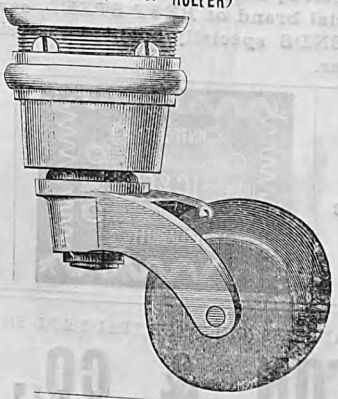
No. 4.
PLATE CASTOR.

The SHEFFIELD BALL CASTORS

Are the Simplest Ball Castors in the Market.
They move freely under pressure.

THE SHEFFIELD ROLLER CASTORS

(No. 6. ROLLER)



Have Screw Bands, which prevent the loosening of the Screws.

Once fixed they cannot work loose.

No. 3.
SOCKET CASTOR.

No. 5.
PIVOT CASTOR.

Price Lists on application to

THE SHEFFIELD CASTOR CO., LD., 3 George Street, **SHEFFIELD.**

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BUCHANAN'S PATENT
"CHILD PROTECTORS."

Recommended by Medical Men,

INCLUDING

DR. ANDREW WILSON, F.R.S.E.,

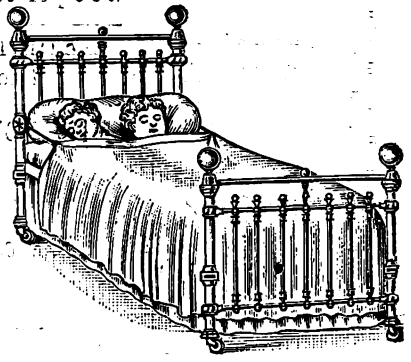
The well-known authority on Health and Hygiene.

INVALUABLE IN EVERY BED-ROOM.

The Children cannot catch cold by the bed-clothes getting off them while asleep.

BUCHANAN'S
Patent
"CHILD PROTECTORS"
May be fixed to any bed by any person.

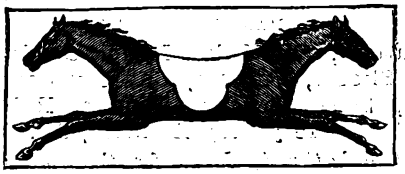
THEY ARE A GREAT SUCCESS WHEREVER IN USE!!



For Reduced Prices and best terms, apply to the Wholesale Agents,

HOSKINS & SEWELL, MIDLAND BEDSTEAD WORKS, BORDESLEY, **BIRMINGHAM**

BEST GERMAN

WIRE  NAILS

WIRE SLATE NAILS.

BAUMANN'S ENAMELLED HOLLOWWARE.

OSCAR MOENICH & CO., 8 COLEMAN STREET, **LONDON, E.C.**

Frying Pans. **BRADLEY & Co.** Tea Kettles.

RICE BOWLS · DISHED SHEETS

BATHS · SLOP PAILS &c.

GALVANIZED BUCKETS

WATERLOO SCOOPS

WATERING CANS ·

COOK'S LADLES, FORKS AND SKIMMERS.

BILSTON

WASHHAND BASINS, WATER BOWLS &c.

STOKES & Co

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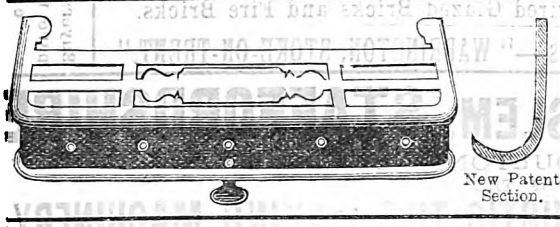
HANDLEY & WILKINS,

MANUFACTURERS OF

PINCERS, PLIERS, NIPPERS, COMPASSES, WIRE GAUGES,

Hammers, and Heavy Steel Toys in General,

PHILLIPS STREET WORKS, ASTON BROOK, BIRMINGHAM.



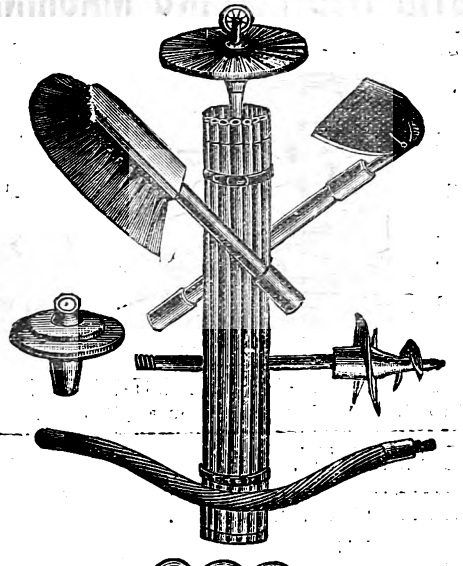
New Patent Section.

ROBERT PEEL, PROVIDENCE WORKS, BRADFORD,

Manufacturer of

KITCHEN FENDERS, FIRE IRONS, TOP BARS, FIRE STANDS, &c.

PRICES ON APPLICATION.



DRAIN CLEARING

—AND—

CHIMNEY SWEEPING MACHINERY.

ASHFORD & WINDER,

ESSEX ST., BIRMINGHAM. KENT ST.

JOYCE'S

AMMUNITION.

SPORTING CARTRIDGES.

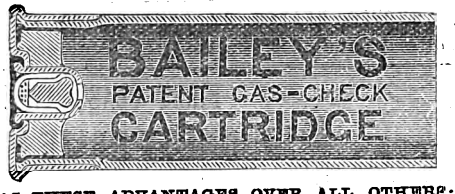
CENTRAL and PIN FIRE, in all Qualities and Sizes.

PERCUSSION CAPS.

Introduced 1820. Certain of Ignition in all Climates.

GUN WADDING.

Best Elastic Felt, Hair Felt, and Brown Felt, of uniform thickness; also Cloth and Card Wads.



HAS THESE ADVANTAGES OVER ALL OTHERS:—

1st.—It is hermetically sealed, absolutely gas-tight, and does not miss fire.
2nd.—It has a stronger base, and does not burst at the rim.
3rd.—Having no escape of gas backwards, it shoots harder, and cannot corrode strikers and locks.
4th.—Though adapted for any central-fire gun, it is especially recommended for hammerless.
5th.—Being highly polished and light, it works better in ejector guns.
6th.—Can be re-capped in one quarter the time of any other cartridge.

Sold in Four Colours, and cheap enough to throw away after use.

TO BE HAD OF ALL GUNMAKERS.

SOLE MANUFACTURERS—

F. JOYCE & CO., LIM., LONDON.

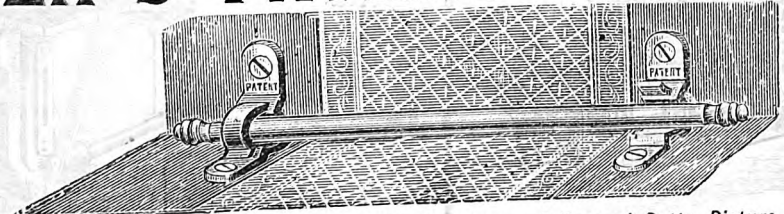
WHOLESALE ONLY.

RICHARD'S PATENT SCREW HOOKS AND RINGS.

HYLAND'S "GORDON" CURTAIN HOOKS.

PHILLIP'S PATENT STAIR EYE.

SIMPLE
NEAT,
INEXPENSIVE.



NO SPRINGS
TO GET
OUT OF ORDER.

COOKE BROS.,

Makers, also Manufacturers of Pressed Butts, Picture Rod Hooks, Curtain Hooks and Rings, and all kinds of Light Cast and Stamped Brassfoundry.

CONSTITUTION HILL, BIRMINGHAM.

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BERRY HILL & HOLLY BUSH COLLIERY & IRON WORKS,

Registered Brand.

Near STOKE-UPON-TRENT, STAFFORDSHIRE.

WB

Maker of HOOP IRON, BAR IRON, ANGLES, TEES, HALF-ROUND, CONVEX, OVALS, SHOEING IRON of superior quality, and a variety of other sections.

A FAVOURITE BRAND WITH SMITHS AND ENGINEERS.

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LONDON OFFICE, 91 CANNON ST., E.C. Telegraphic Address—"WARRINGTON, STOKE-ON-TRENT."

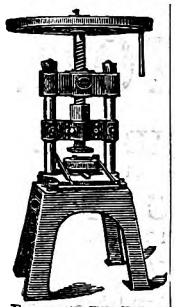
Buyers are invited to compare this Iron with more expensive brands.

WILLIAM BOULTON, BURSLEM, STAFFORDSHIRE

Telegraphic Address:—"BOULTONS, BURSLEM,"

MANUFACTURER OF THE

LATEST IMPROVED POTTERY & ENCAUSTIC TILE MAKING MACHINERY.



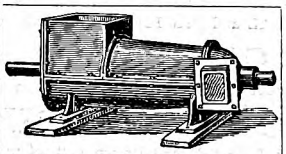
Encaustic Tile Press.

PATENT AUTOMATIC DOUBLE JIGGER & JOLLEY

Makes a very large quantity of Cups, Bowls, &c.

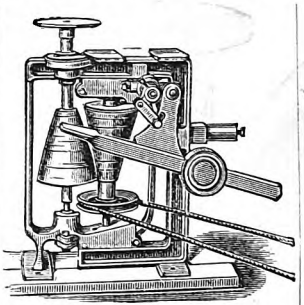
Patent Blungers, Pumps, Presses, Sifters, Throwing Wheels, Lathes, Jiggers, Whirlers, and Jolleys.

Also Flint, Stone, Bone, Glaze, Colour, Gold, Borax, and other Mills, and Magnetising Machines.

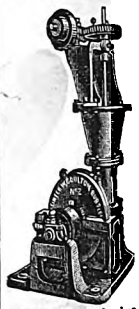


Improved Potter's Pug Mill.

Encaustic and Plain Tile Presses, Moulds, Pattern Plates, Dry Clay Crushing and Grinding Mills, and New Patent Damped Clay Pulveriser.



Patent Throwing Wheel.



Damped Clay Pulveriser or Dust Mill.

DRYING STOVES HEATED BY EXHAUST OR FRESH STEAM, AND BY THE HIGH-PRESSURE HOT-WATER PRINCIPLE.

Potteries and Tile Works fitted complete, at Home and Abroad. Particulars on application.

FIRST CLASS AWARD, MELBOURNE EXHIBITION, 1889.

HIGHEST PRIZE MEDAL, INVENTIONS EXHIBITION

First Class Award of Society of Architects, &c.

For Brick Making and Pressing Machinery for Plastic and Semi-plastic and Semi-dry Brickmaking by Steam or Animal Power.

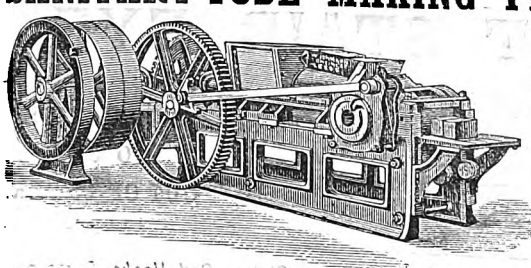
W. JOHNSON, CASTLETON FOUNDRY, LEEDS, ENGLAND,

MAKER OF

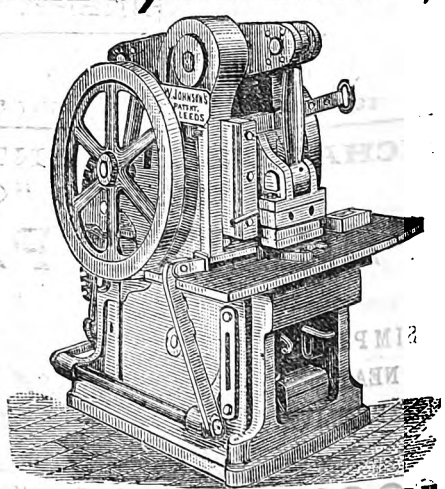
GENERAL BRICK, TILE,

AND

SANITARY-TUBE MAKING PLANT



(JULIUS WHITEHEAD'S PATENT)



PURPLE, NICKEL, &c., ORES & COAL BRIQUETTE MACHINERY.

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Successors to MARRIOTT & ATKINSON, LIMITED,

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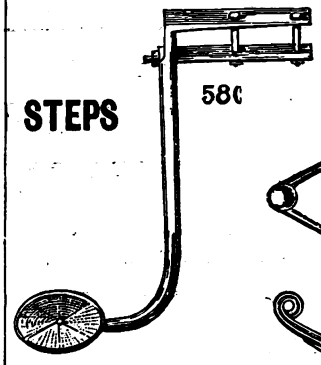
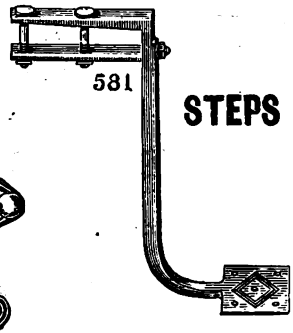
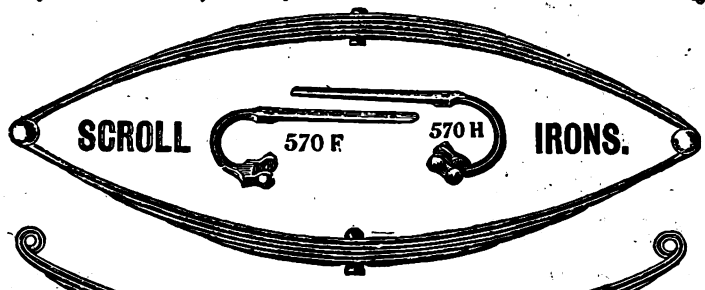
DRAY, VAN, AND LURRY SPRINGS.

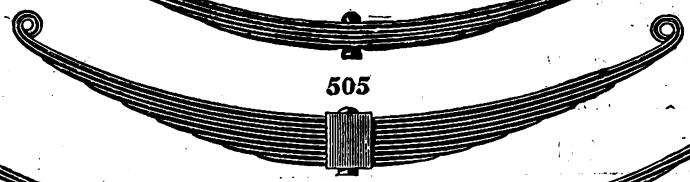
STEPS

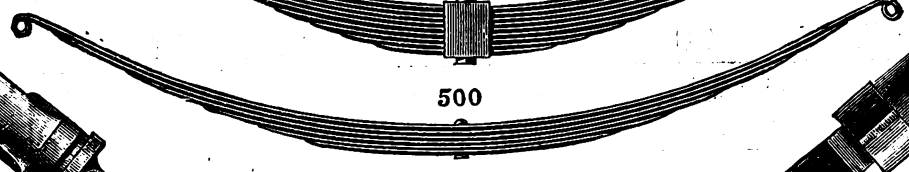




STEPS

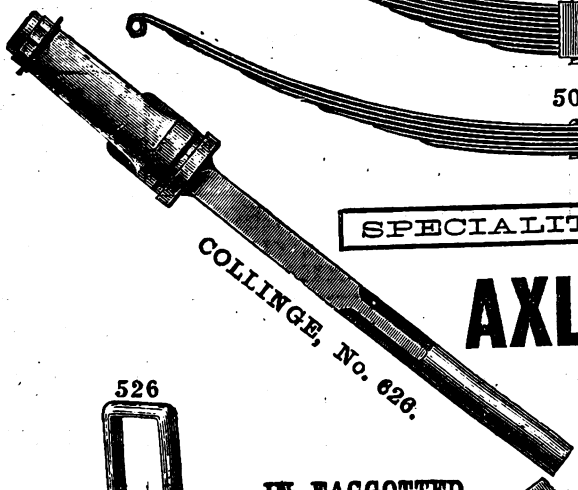


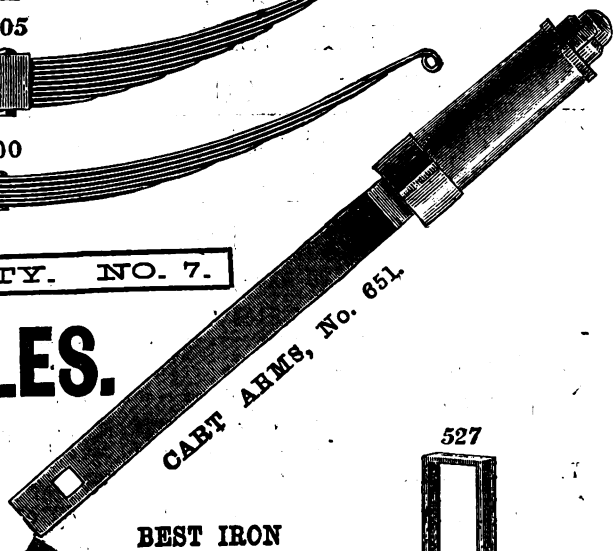




SPECIALITY. NO. 7.

AXLES.





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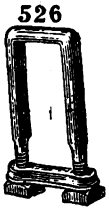

SPRING CLIPS.

IN FAGGOTTED BEST IRON AND MILD STEEL

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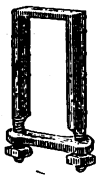
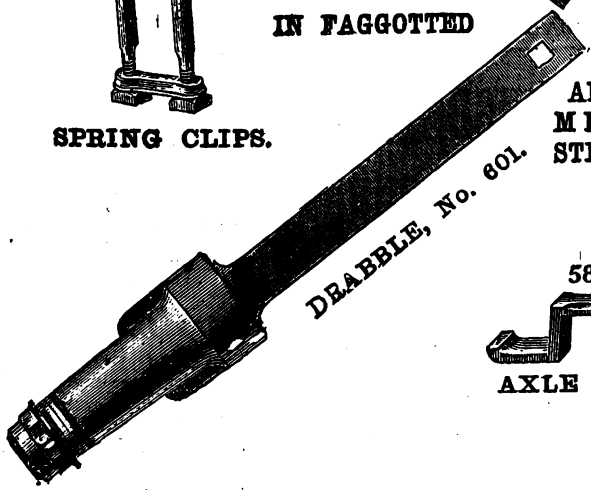
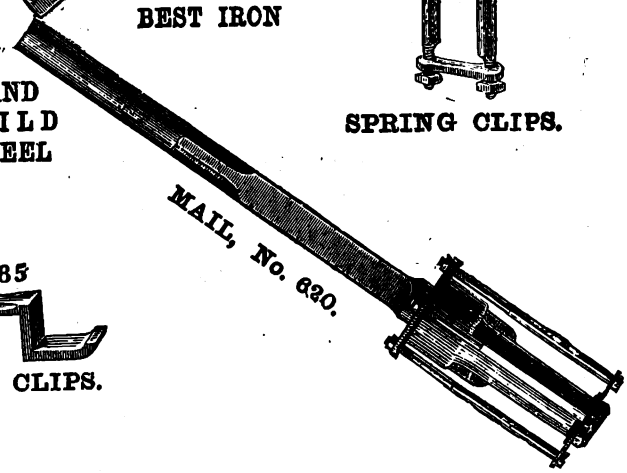


SPRING CLIPS.





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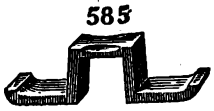

AXLE CLIPS.

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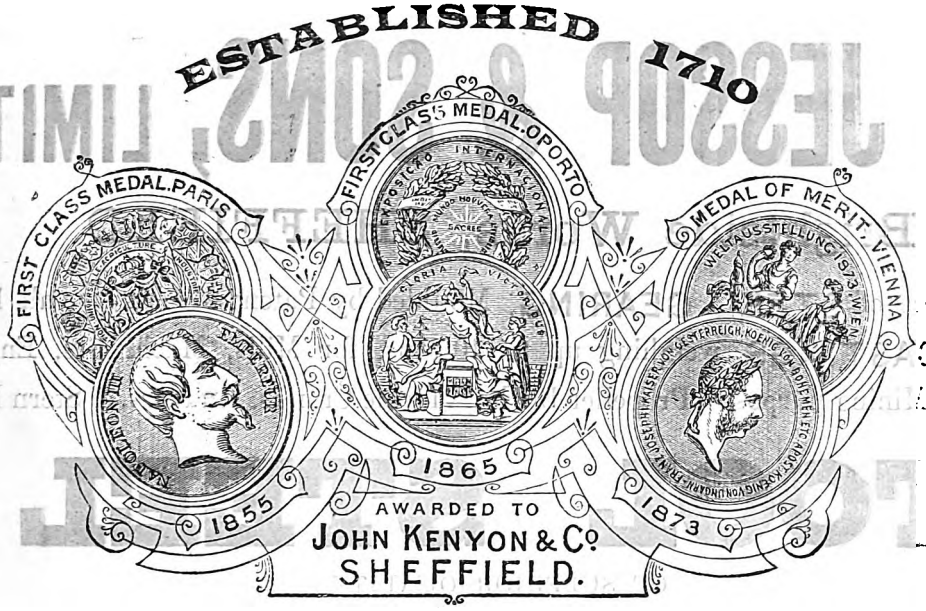

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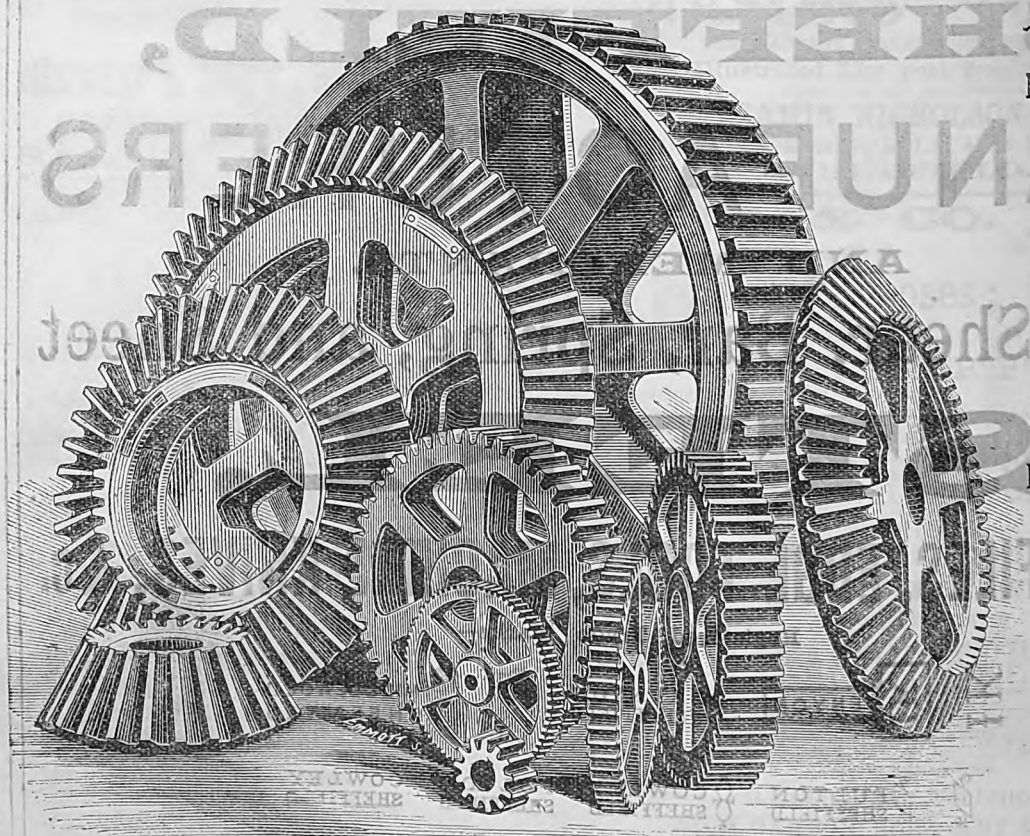

EXHIBITION AWARDS.

Paris, 1889.
Paris, 1878.
London, 1884.
Antwerp, 1885.
Liverpool, 1886.
Melbourne, 1881.
Tynemouth, 1882.
Inventions, 1885.

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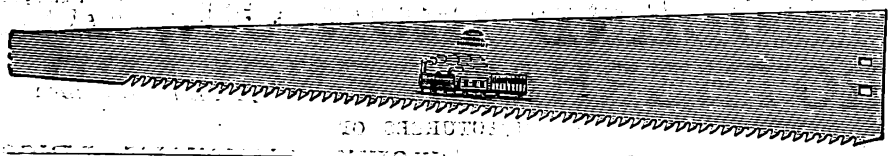

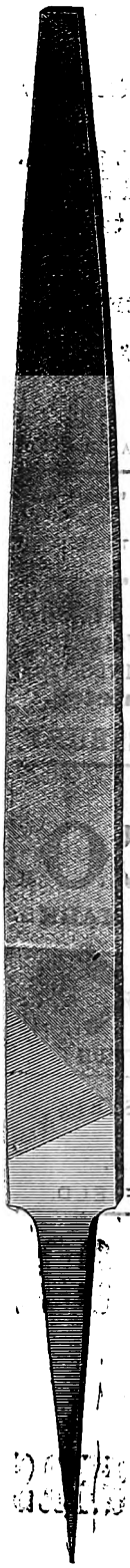

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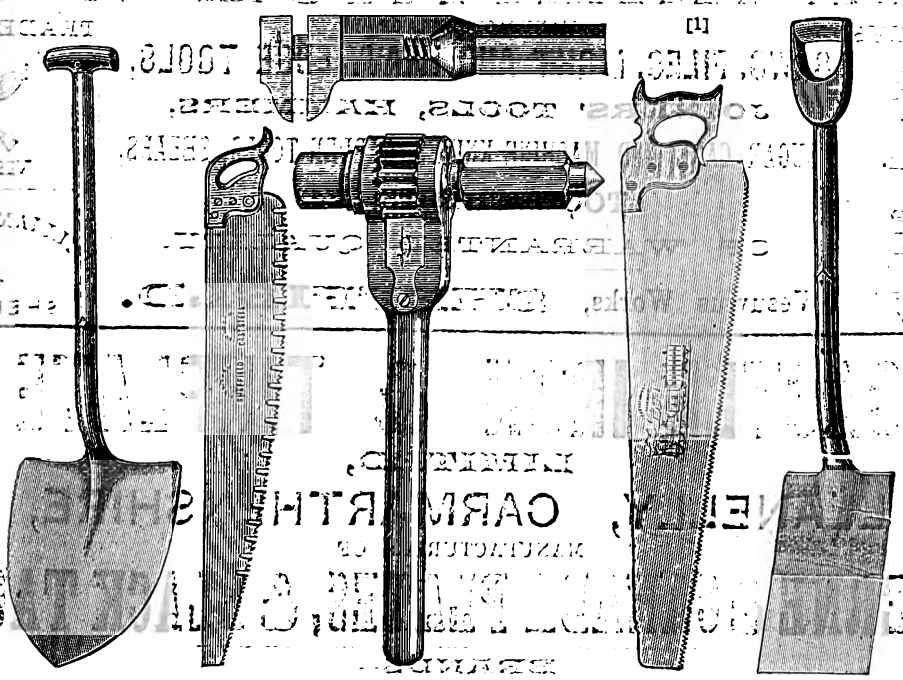

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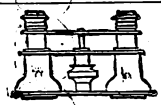

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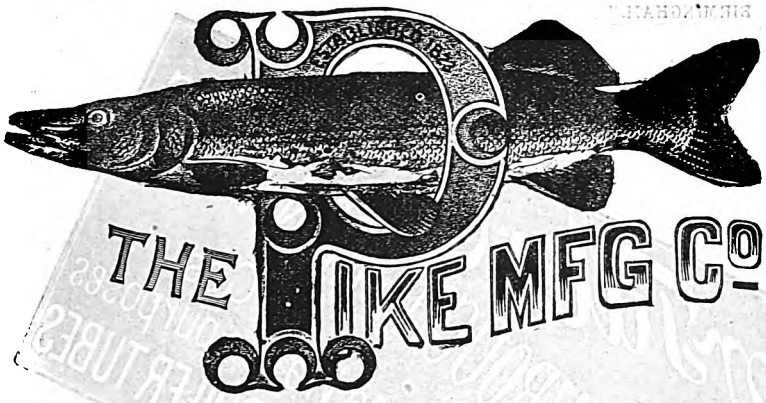

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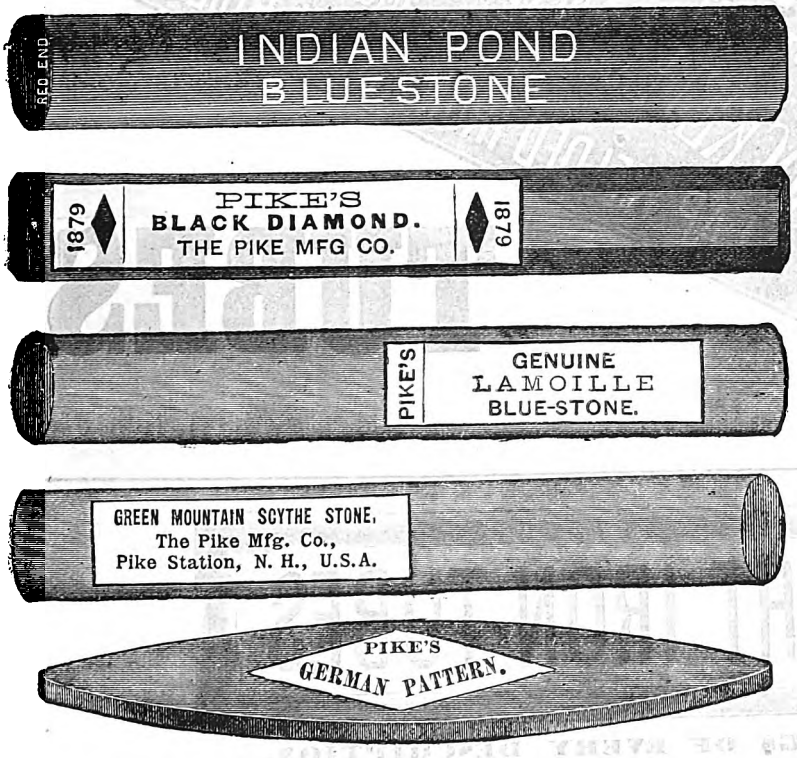
and other Stones are produced.



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Coombs Wood Works, HALESOWEN.
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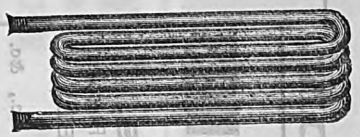

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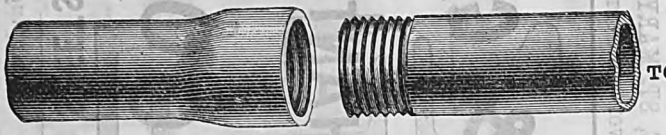
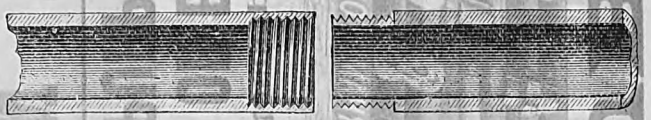


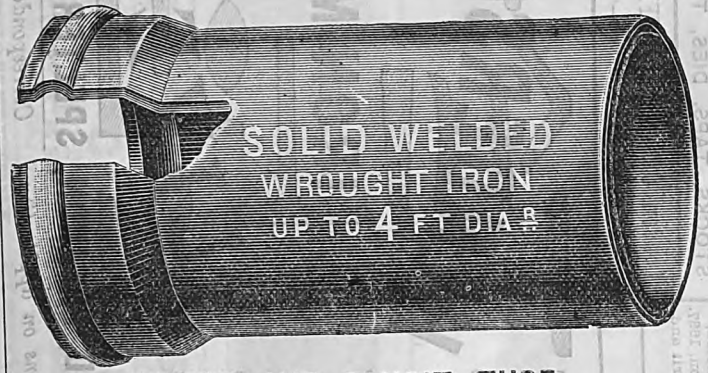
SWELLED JOINTED TUBE.

TRADE L & L MARK.

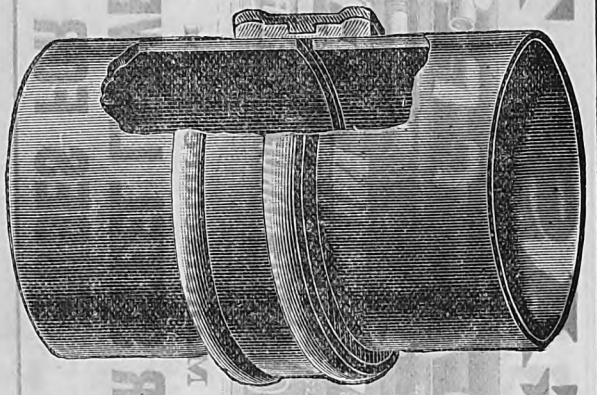


FLUSH JOINTED TUBE.

TRADE L & L MARK.



SPIGOT AND FAUCIT TUBE.



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Gas, Water, Steam, and Galvanised Tubes and Fittings.

Boiler Tubes of Iron, Steel, and Homogeneous Metal.

ALBION TUBE WORKS BIRMINGHAM.

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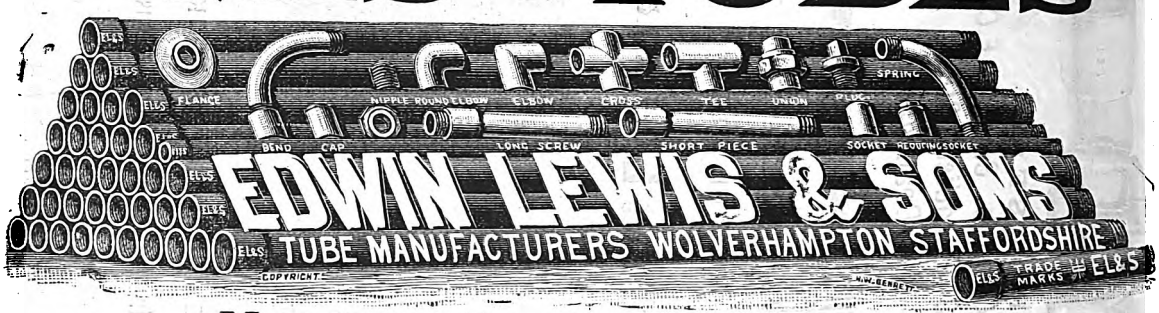
GAS TUBES



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WOLVERHAMPTON.

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COILS OF ALL SIZES AND SHAPES.

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ROLLED GIRDERS,
RAILS, HOOPS,
SHEETS,
NAIL RODS,
SWEDISH RODS,
FENCING AND TELEGRAPH WIRE,
CHEQUERED PLATE,
BOILER, TANK, & SHIPBUILDING PLATES.

HENDERSON & GLASS

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LIVERPOOL.

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TINNED AND GALVANISED SHEETS,
Corrugated or Plain for working up
COKE AND CHARCOAL TIN PLATES
TERNE AND CANADA PLATES,
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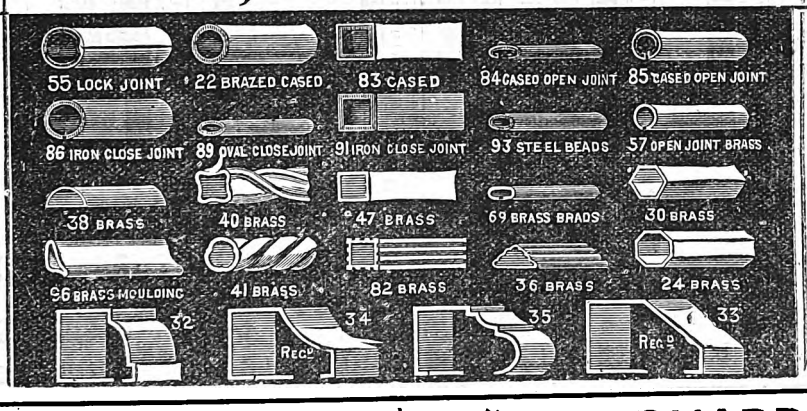

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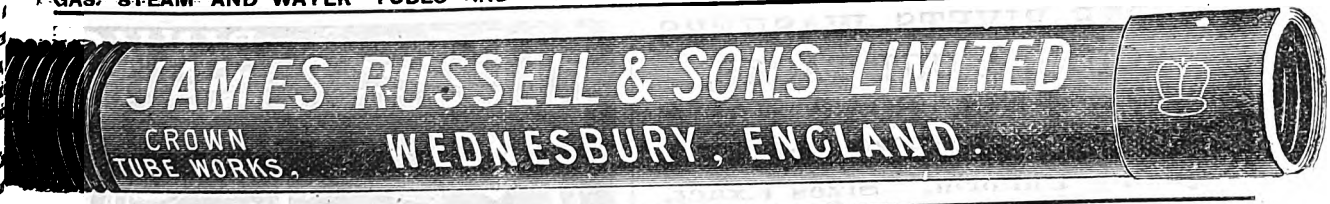

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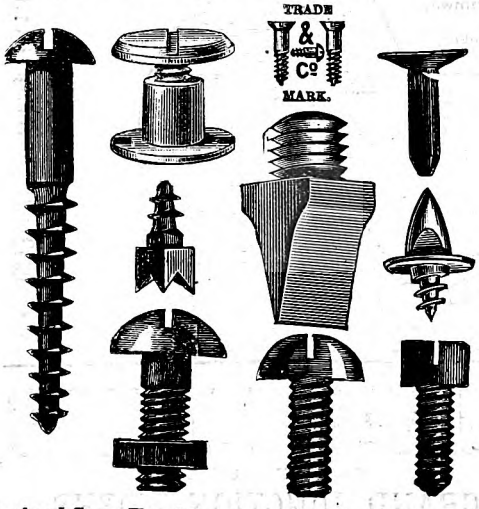

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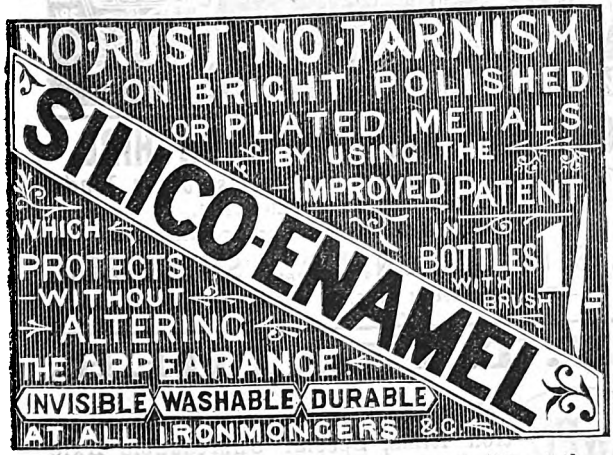

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No Wet Walls!
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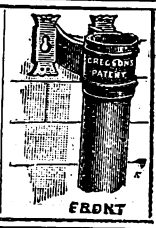

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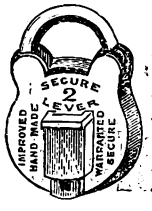

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OF EVERY DESCRIPTION.
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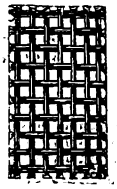

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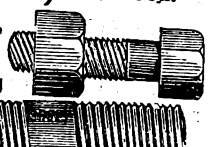

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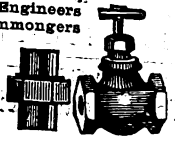

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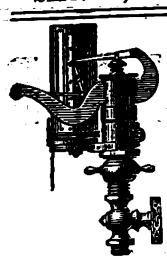

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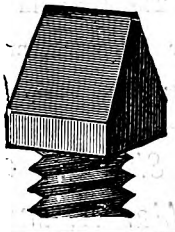

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WILSON'S Steel Frost Screws
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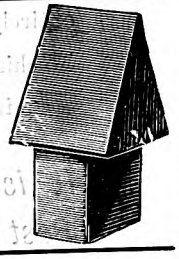

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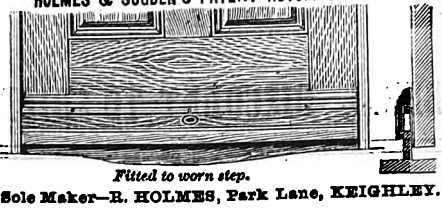

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INODOROUS, DRY HAIR, & SHIP SHEATHING FELTS,
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For Gas, Steam, Water, Hydraulic, and Heating Purposes, also for Compressed Air, Galvanized or White Enamelled inside, in stock to 6 inches diameter.
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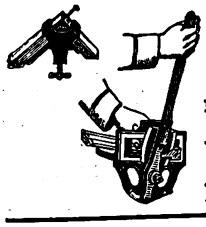

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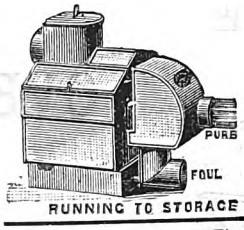

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These Churns are made to revolve upon anti-friction rollers, by which the labour of churning is reduced to a minimum. They are fitted with Hopperton's newly-invented *Diagonal Dash*, which, for firmness in butter and quickness in churning, stands unrivalled; and are fitted with a *perfect air-discharging valve*, a catch to hold it firm whilst pouring in the cream, which can be at once secured by the action of one finger. *The Frames are built upon entirely new principles*, firmly bolted and secured together. W. B. HOPPERTON, Cooper to H.M.'s Inland Revenue, PRIZE CHURN MANUFACTORY, NORTHGATE, DARLINGTON.

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FOR
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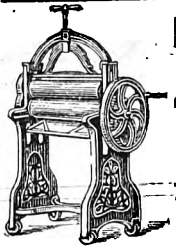
Sawing Cold Steel AND IRON.
Steel, Saw, File, & Tool Manufacturers,
ALFRED BECKETT & SONS, Brooklyn Works, SHEFFIELD.



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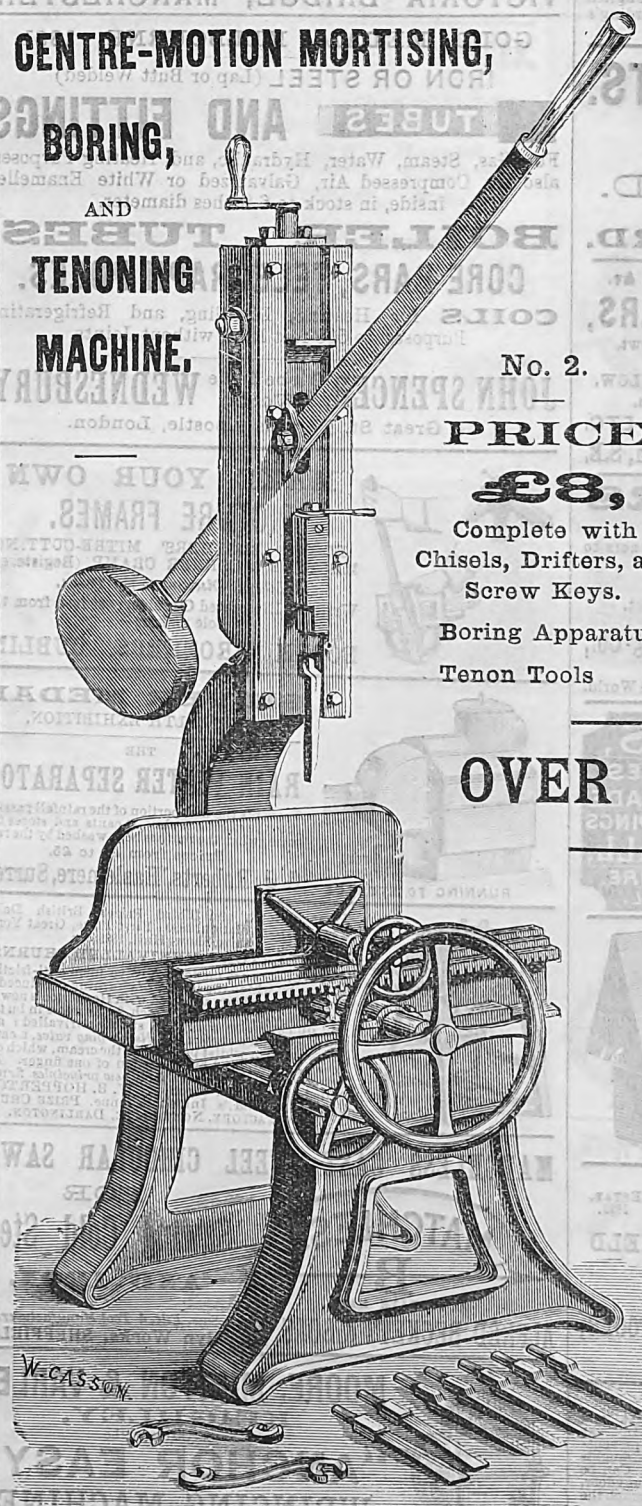

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Complete with Chisels, Drifters, and Screw Keys.

Boring Apparatus ... ... £1 10s. extra.

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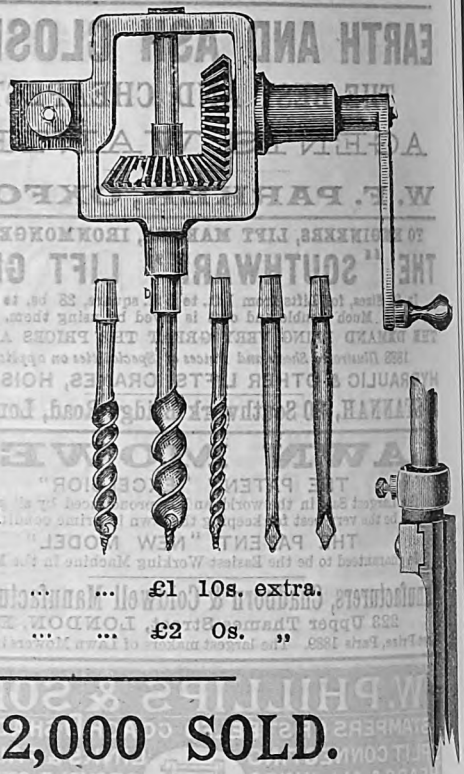

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The old principle—lever working off side—entirely dispensed with. The lever in this Machine being direct over its work, makes it more powerful and easier to work.

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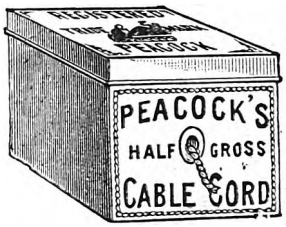

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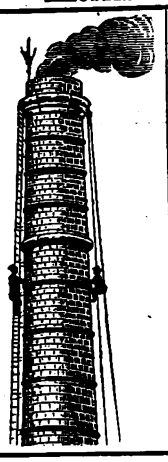

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CHURCH SPIRES RESTORED. CHIMNEY COLUMNS REPAIRED, POINTED, Hooped, Raised, Straightened, &c., WITHOUT STOPPAGE OF WORKS.

EXPERTS SENT TO ALL PARTS

Largest Stock (at best terms) of GILT AND SILVER WIRE PICTURE CORDS, COPPER, STEEL, AND IRON SASH LINES, and every description of

WIRE ROPES AND CORDS.

Established 1875. Telegrams—"ORCHARD BIRMINGHAM."

CARDIFF

TIN STAMPING & ENAMEL Co.

LIMITED.

WORKS: EAST MOORS, CARDIFF.

Telegrams: "ENAMEL CARDIFF."

LONDON OFFICES AND SHOW ROOMS:

62 Holborn Viaduct (over Snow Hill Station).

AGENT: C. F BOURNE.

TELEGRAMS: "ALUMINIUM LONDON."

PARIS OFFICES AND SHOW ROOMS:

20 Rue du Chateau d'Eau.

AGENT: ALFRED GAINE.

TELEGRAMS: "GAINE PARIS."

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THE

"LANCASHIRE" BELT

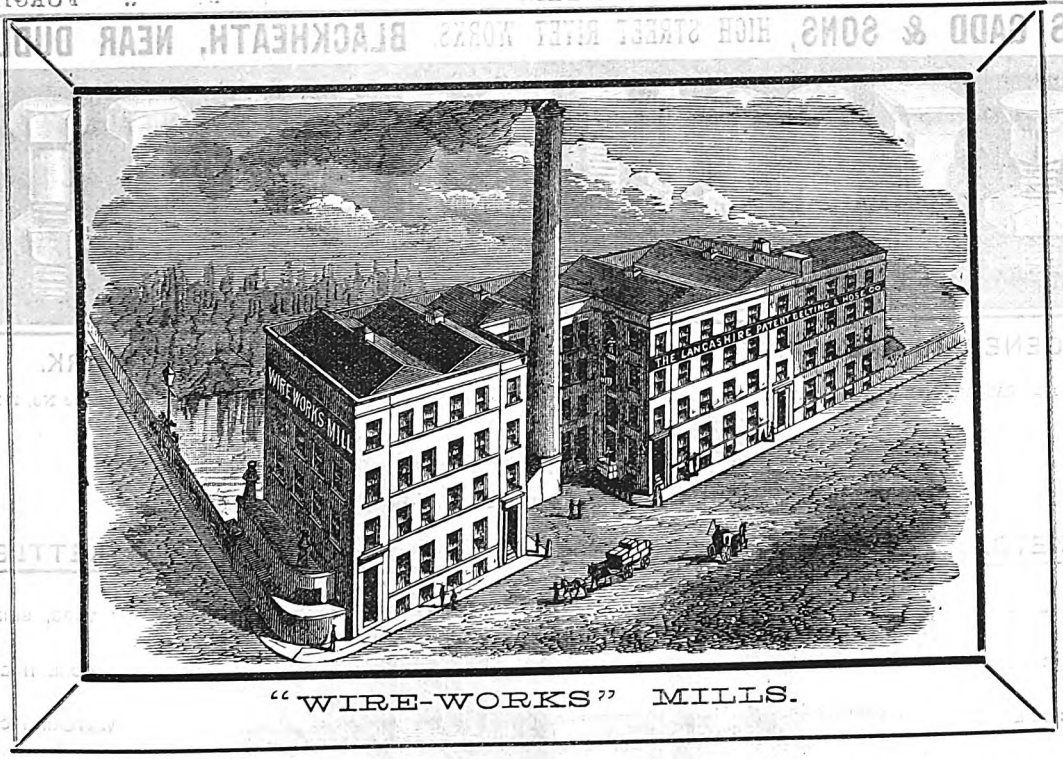
HAS STOOD THE TEST OF

THIRTY YEARS

AND IS THE

ORIGINAL AND ONLY GENUINE

FABRIC BELT.



"WIRE-WORKS" MILLS.

PATENTEES AND SOLE MAKERS:

THE LANCASHIRE BELTING Co.

(ESTABLISHED 1860),

"WIRE-WORKS" MILLS,

STRANGEWAYS, MANCHESTER.

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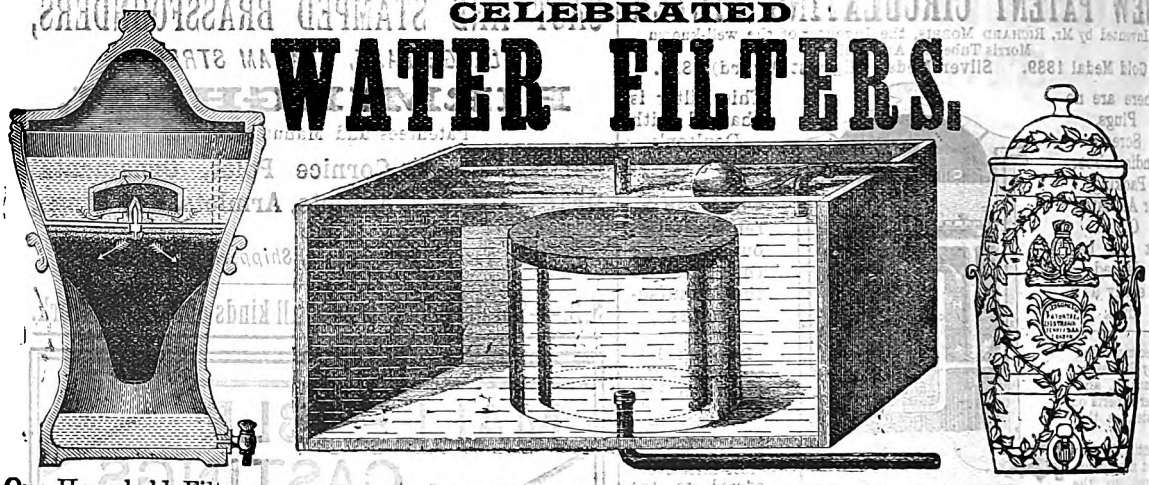
FRED. LIPSCOMBE & CO.'S CELEBRATED WATER FILTERS.

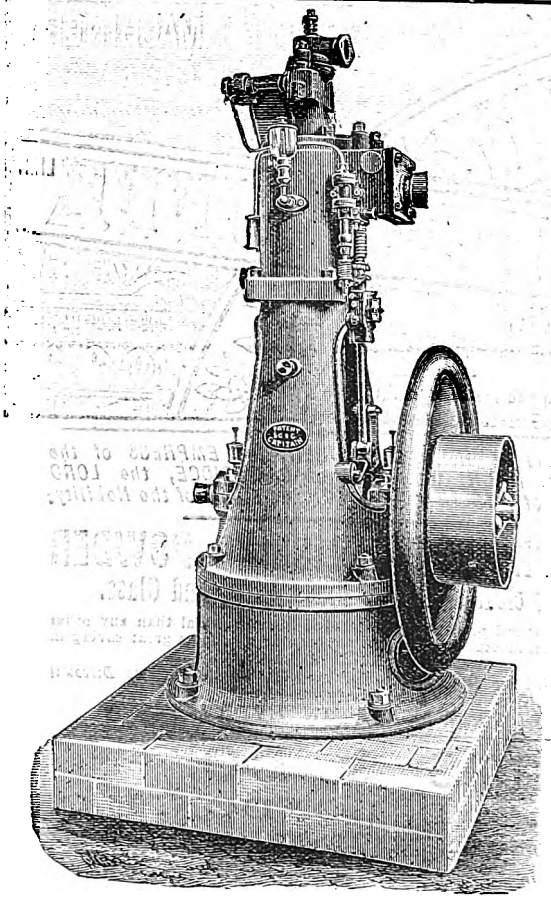


Our Household Filters are constructed on such a principle that the grosser impurities in the water are arrested in the Strainer (charged with pure granular carbon); thus the lower medium is protected and a double system of filtration effected. Nearly **500,000** in use throughout the world. Cistern Filters on our Patent Cylinder principle in all sizes and to supply any body of filtered water. All descriptions of Filters in stock, such as Glass Filters, Ship's Filters, Water-barrel, Bucket, and Tank-cart Filters.

Testimonials, Price List, and Discounts on application to

FREDERICK LIPSCOMBE & CO.

233 STRAND, LONDON; AND CHESTERFIELD.



CAPITAINE'S PATENT PARAFFIN OIL MOTOR

1, 2, 4 HORSE-POWER,

Operated by ORDINARY Paraffin Oil, as used for Lamps.

ABSOLUTELY SAFE, NO EXTRA INSURANCE

Occupies less room than any other Motor.

BEST & BY FAR THE CHEAPEST MOTOR.

CAPITAINE'S PATENT GAS MOTOR.

Absolutely Safe,
Compact, Reliable, Low Price.

O. BEREND & CO.

61 Fore Street,

LONDON, E.C.

AGENTS WANTED ABROAD.
NONE BUT FIRST-CLASS FIRMS NEED APPLY.

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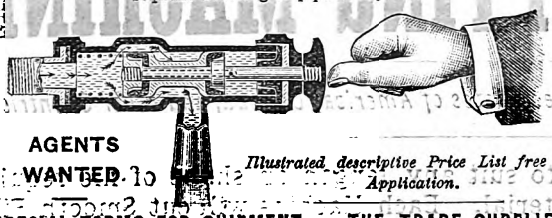
THE AUTOMATIC TAP SYNDICATE (LIMITED),

11 Queen Victoria Street, LONDON, E.C.

The pressure of water in the supply pipe automatically and gradually closes this Tap, saving water and avoiding concussion in pipes, and consequent bursting of pipes and joints.



AGENTS WANTED.

Illustrated descriptive Price List free on Application.

SPECIAL TERMS FOR SHIPMENT. THE TRADE SUPPLIED.
Cable and Telegraphic Address, "FERREUS LONDON."

TRADE MARK.

CHADBURN BROTHERS,

Opticians, Albion Works, Sheffield,

MANUFACTURERS OF

SPECTACLES,

SHIP & PORTABLE TELESCOPES, MICROSCOPES,

Lime-Light Apparatus,

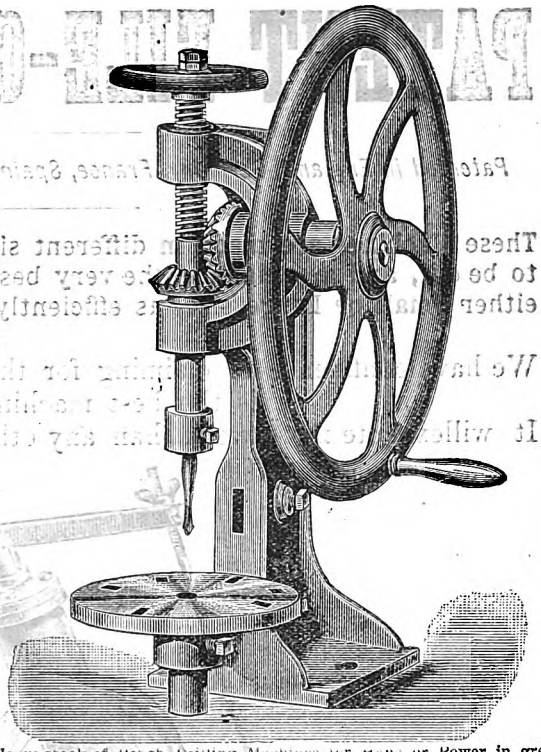
AND ALL KINDS OF OPTICAL LENSES.

LIST ON APPLICATION.

VERNON & GUEST

ALMA WORKS, SOHO, BIRMINGHAM.

Telegrams:—"Engine, Soho, Birmingham."



A large stock of Bench Drilling Machines for Hand or Power, in great variety, ready for delivery. Write for Illustrated Price List.

GEORGE SALTER & CO.

SALTER

WEST BROMWICH,

TRADE MARK.

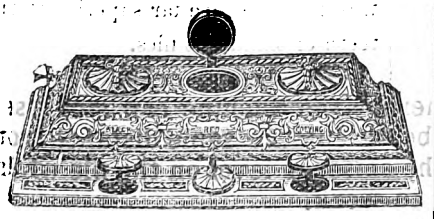
PATENTEES AND MANUFACTURERS OF

SPRING BALANCES AND DYNAMOMETERS,

SAD IRONS AND BOX IRONS,

ROASTING JACKS, DUMB-BELLS,

WIRE HAT AND COAT HOOKS,



AUTOMATIC INKSTAND.

For Black, Red, and Copying Ink. The opening of one lid closes another.

Price 3/6 and 4/6 each.

DOOR SPRINGS AND

PNEUMATIC DOOR CHECKS

Grating Machines for Bread, &c.

FOUNTAIN CLOTHES WASHERS,

STEEL PIPE HOOKS,

DOLLY SPRINGS, BICYCLE SPRINGS,

Steam Gauges and Colliery Bells.

Mitchells' Patent "Simplex" Lawn Tennis Poles.

BOX IRON.

Price, with Lifter and Two Heaters, from 1/9 each.

ALL KINDS OF STEEL SPRINGS MADE TO ORDER.

GOODS SUPPLIED THROUGH MERCHANTS AND FACTORS.

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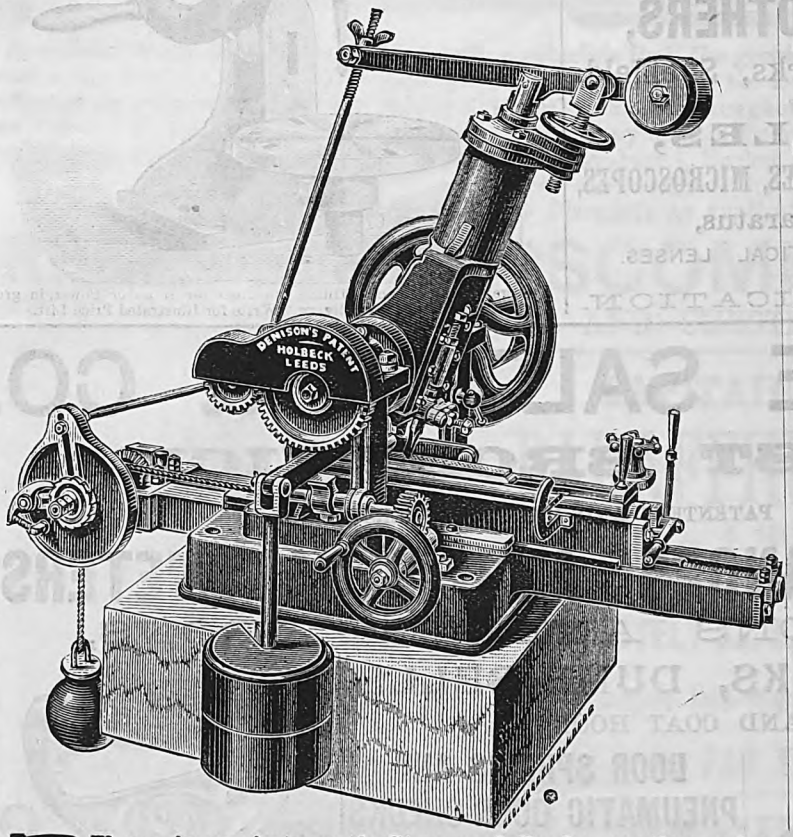
THE DENISON
PATENT FILE-CUTTING MACHINE.

Patented in England, Germany, France, Spain, United States of America, Canada, and other Countries.

These Machines are made in different sizes, to suit any length or shape of file required to be cut, and are made of the very best material. Each Machine will cut Smooth Files, either Small or Large size, as efficiently as it will cut Bastard Files, and will also edge the Files.

We have confidence in claiming for the "Denison Patent File-cutting Machine" that it is the best machine ever placed in the market.

It will execute more work than any other File-cutting Machine, and cuts files perfectly.



We claim for our Patent File-cutting Machine the following advantages:—

1.—Simplicity of Construction, so that any part wearing out can be easily and quickly replaced.

2.—Cheapness and durability.

3.—Simplicity of arrangement in holding the chisel, whereby the head or cylinder part of the machine is made movable, and can be set for the chisel to strike straight into the file or at an angle of 45 degrees, thus giving two angles of cut on the same file, which gives the shape of a hand-cut tooth. Also the file is held securely on the bed, and remains stationary, in the very centre of the machine, on a solid iron foundation, while each blow is being struck.

4.—The Teeth of the files cut by this machine are far superior to the teeth of hand-cut files.

☛ **There is an Automatic Stop and Brake motion, whereby the Machine can stop itself at any given point, and which ensures each file being cut the same distance from the heel. Also an Indicator for showing when the chisel is level on the file whilst being cut. This makes the Machines very easy to work.**

Large numbers of these Machines are working, and can be seen by arrangement with us.

PRICE LISTS AND FULL PARTICULARS ON APPLICATION.

THE DENISON PATENT FILE-CUTTING MACHINE CO.

SYDENHAM WORKS, HOLBECK, LEEDS.

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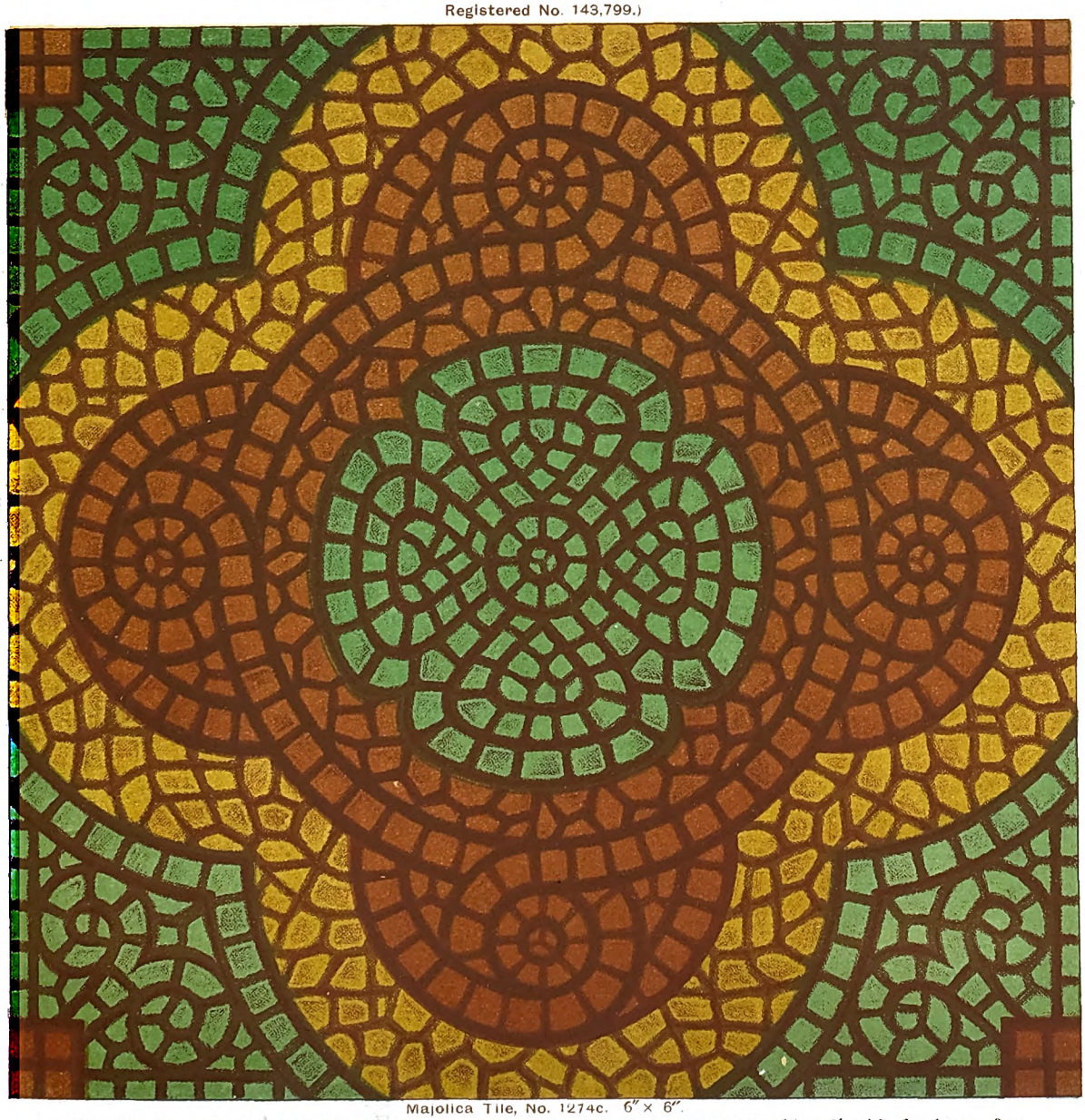
T. & R. BOOTE,
BURSLEM,
STAFFORDSHIRE,

MANUFACTURERS OF ENCAUSTIC FLOORING, GLAZED, PRINTED, ENAMELLED AND MAJOLICA TILES OF EVERY DESCRIPTION.

Registered No. 143,799.)



Majolica Tile, No. 1274c. 6″ × 6″.

This Tile is specially adapted for hearths, as it has no high Embossments to chip off with fire-irons, &c.
Price 5/- per doz. in this colouring.

Ironmongers and dealers are invited to apply for new Catalogue of Printed and Majolica Tiles, Slabbed Hearths and Panels. All enquiries to the Works, BURSLEM, will have prompt attention

WORKS:
BURSLEM,
STAFFORDSHIRE.

LONDON OFFICE:
WALTHAM BUILDINGS,
HOLBORN CIRCUS,
E.C.

SEE OVER.

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TILES
FOR
FLOORS,
HEARTHS,
GRATE
CHEEKS,

T. & R. BOOTE,
THE PATENT TILE WORKS,
BURSLEM,
STAFFORDSHIRE.

SLABBED
HEARTHS,
FURNITURE
TILES,
WHITE BATH
TILES.

SEE OVER.

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JOSEPH WOODHEAD.

TRADE MARK, REGISTERED

ESTABLISHED 1830

ALSO MANUFACTURER OF TRUNKS BOXES BATHS CORDS AND FLOURBINS

JAPANNED WARE & JAPANNER TO THE TRADE

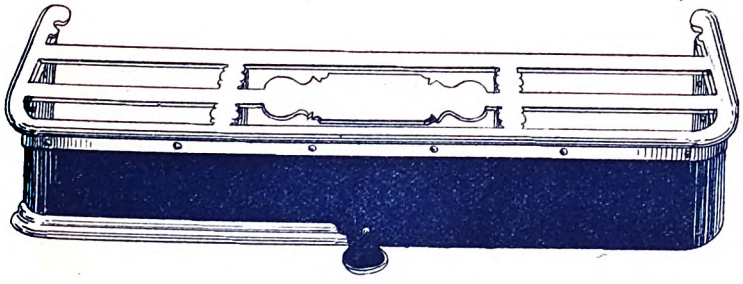
Manufacturer of

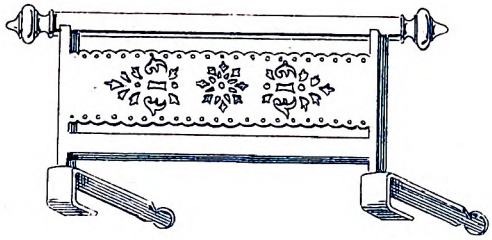
FENDERS · FIRE IRONS · TOP BARS · ASHPANS · FIRE STANDS · SPADES · SHOVELS

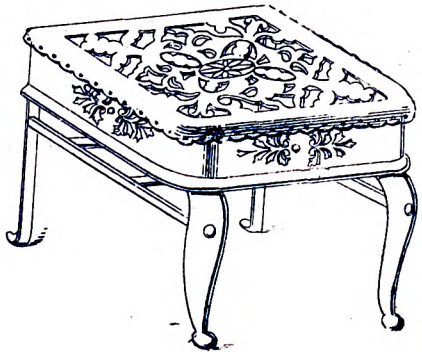
FIRE SHOVELS · DRAINING TOOLS · HAY · MANURE & DIGGING FORKS · CONTRACTORS TOOLS &c.

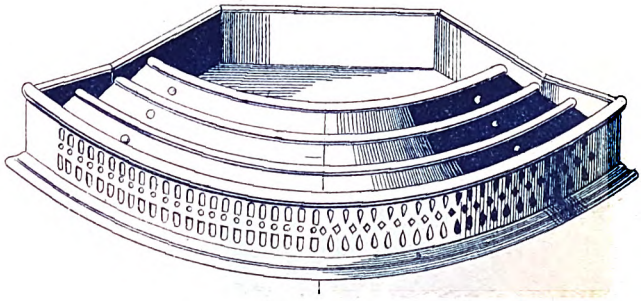
Vaughan Works, BRADFORD, Yorkshire.

IMPROVED DEEP ROUND EDGE FENDERS, TWO PATTERNS.
LARGEST MAKER IN THE KINGDOM.









WRITE FOR CATALOGUE AND PRICES.

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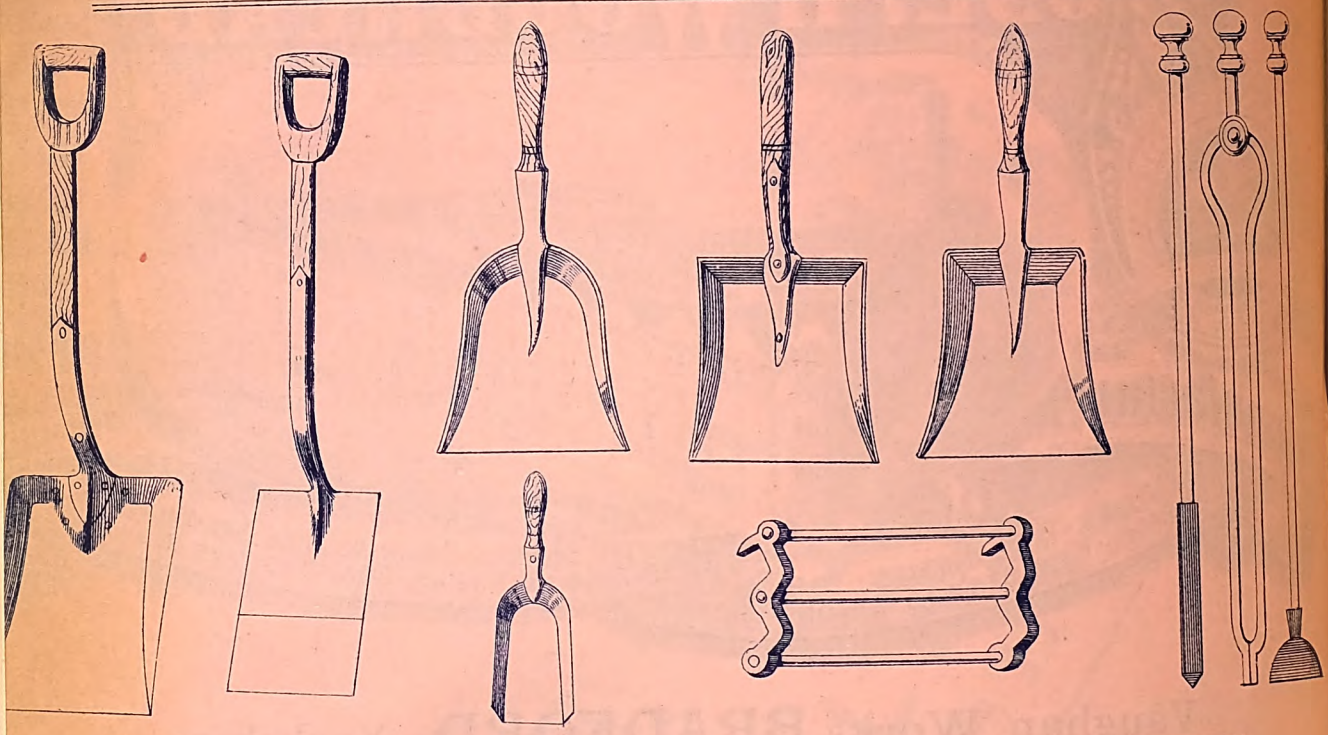
JOSEPH WOODHEAD,

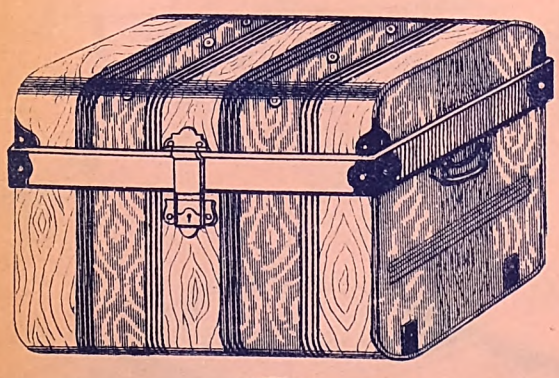
Vaughan Works, BRADFORD, Yorkshire.

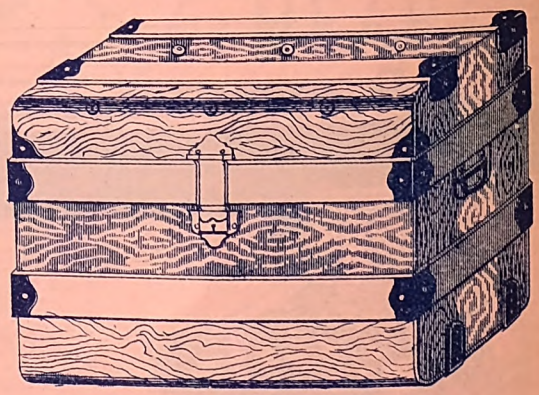


ALSO CHEAPEST MAKER OF

TRUNKS, BOXES AND BATHS.

→* WRITE FOR NEW SPECIAL LIST. *←





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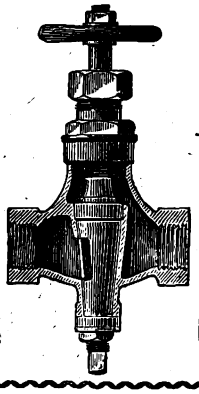
A. E. ALLEN & CO., Engineers, &c., 37, Wellington St., Hull.

PATENT VALVE TAP.

SECTION.



All Valve Stuffing Boxes are Packed with Asbestos.

All Valves are tested with Steam at 100 lbs. per square inch before leaving the Works.

THE BEST VALVE IN THE WORLD.

IMPORTANT ADVANTAGES OVER ALL OTHERS.

1. A perfect Tight Valve.
2. The Valve and Seat are Removable.
3. Can be changed under pressure without stoppage of the Boiler.
4. The body of the Valve is never taken off so long as the Pipes are up.
5. No waiting till the Steam is blown off to grind the Valve in, this can be done while all is at work (in the Lathe or Vice).
6. This Valve does away with all the taking down of used up Valves, and putting on new Valves.
7. In a stack of Boilers when one is standing the Feed Valve Seat can be changed while the pipes are charged with feed water for the other Boilers in use.
8. The Best and most useful Valve ever made.

N.B.—All Valves are made from Gun Metal, warranted.

This Valve is not only a Stop Valve, but also a Feed and Check Valve for Boilers, Pumps, &c.

The object of this invention is to construct valves in such a manner that the valve-seating and cover can be removed, reground, and replaced, *i.e.*, or replaced by a new seat and cover. You will notice that the valve has a hollow conical plug, having an opening on one side, a corresponding opening being made in the valve casing, directly above the plug in the valve seating, and cover screwed down in the ordinary manner, the plug being pressed down tight by the steam, and held in position by the nut. When the seating and valve want replacing, loose the nut at the bottom of the plug, and by striking the plug up with a hammer the valve seat is raised from its place; then first screw the nut up again, and shut the plug by turning it half-way round, which cuts off all communication of the steam with the top part of the valve. Now screw off the top part of the valve, and take out the old seating and cover, and put the new parts in, then screw on the top again, and tighten down the wheel which forces the new seat to its proper place; then open the plug as before, and all is in working order equal to new. This can be done any number of times at a very small cost, as the parts all through the valve are all made duplicates, and can be had at any time out of stock. From the description of the valve you will readily perceive the advantages of same, as the parts are not very liable to get out of order, and in event of any foreign substance getting between the surface of the valve, thus causing a leakage, the damage can be repaired without disturbing any fixings, pipes, &c., which cannot be done in any other valve.

PRICES.

Made also with Flanged Ends.

Size, Inches.	Screwed Ends.	Extra Valve & Seat.	Full Length.	Size of Valve	Diameter of Flanges.	Length of Valve.
½	7/-	2/-	3½ in.	½	3	3½ in.
¾	9/6	2/4	4 ,,	¾	3½	4 ,,
1	13/-	2/10	5 ,,	1	3¾	5 ,,
1¼	22/6	3/6	5¾ ,,	1¼	5	5¾ ,,
1½	28/6	4/3	6¼ ,,	1½	5½	6¼ ,,
2	44/6	4/9	7½ ,,	2	6½	7½ ,,
2½	70/-	5/6	8¾ ,,	2½	7	8¾ ,,

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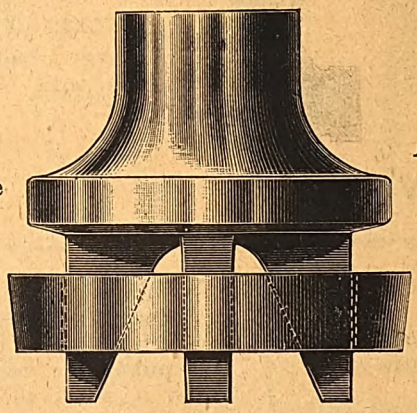
A. E. ALLEN & CO., Engineers, &c., 37, Wellington St., Hull.

Patent Valve Tap.

THIS ILLUSTRATION SHOWS THE

EXTRA DUPLICATE VALVE & SEAT.



All Valve Stuffing Boxes are packed with Asbestos.

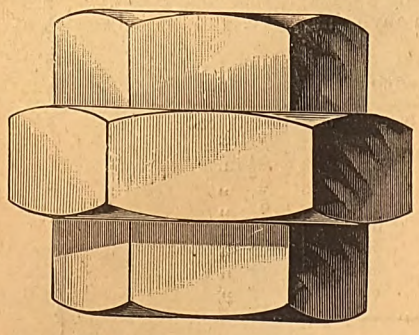
All Valves are tested with steam at 100 lbs. per square inch before leaving the Works.

PRICES OF VALVES & SEATS.

Size	½″	¾″	1″	1¼″	1½″	2″	2½″	3″	4″	5″	6″
For Patent Valve Tap	2/-	2/4	2/10	3/6	4/3	4/9	5/6	7/-	14/-	21/-	
For Patent Feed Valve			3/-	4/-	5/-	6/-					

These Valves and Seats are made from a special mixture of metal, so as to stand well the action of BAD WATER AND CERTAIN CHEMICALS, and each of the sizes are made to standard templates; the same with every part of the Patent Valve, and should any part require to be replaced, this can be done at a very small cost, by customers writing and saying what parts they require—*i.e.* should you take out the Valve and Seat of a 1 in. Patent Valve, and replace it with a new one, after re-grinding same it may be put into any other 1 in. Patent Valve; the same with all the other sizes.

STRONG
BRASS STEAM UNIONS.



These are very strong in the rough, can be polished if required. In ordering, please say polished, as, if not stated, they will be sent in the rough.

Size	½″	¾″	1″	1¼″	1½″	2″
Price	2/-	2/9	3/6	5/-	7/6	12/-

Polished same price as Rough.

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A. E. ALLEN & CO., Engineers, &c., 37, Wellington St., Hull.

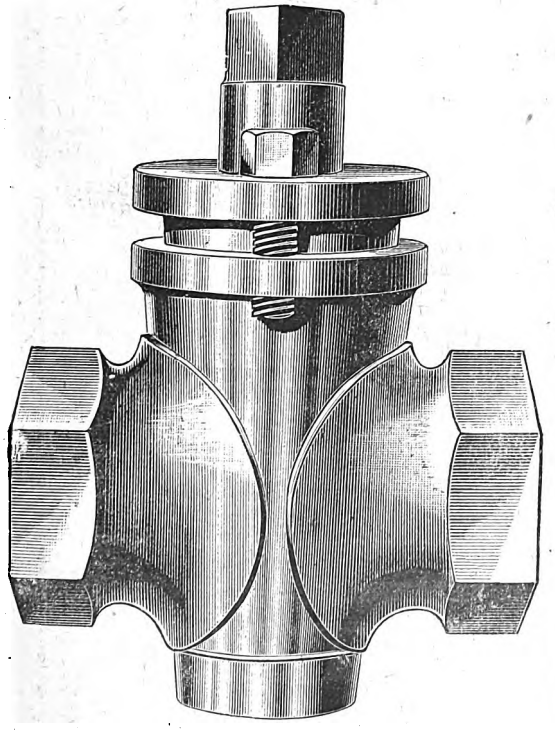
GUN METAL

ORDINARY

PLUG & GLAND TAPS.

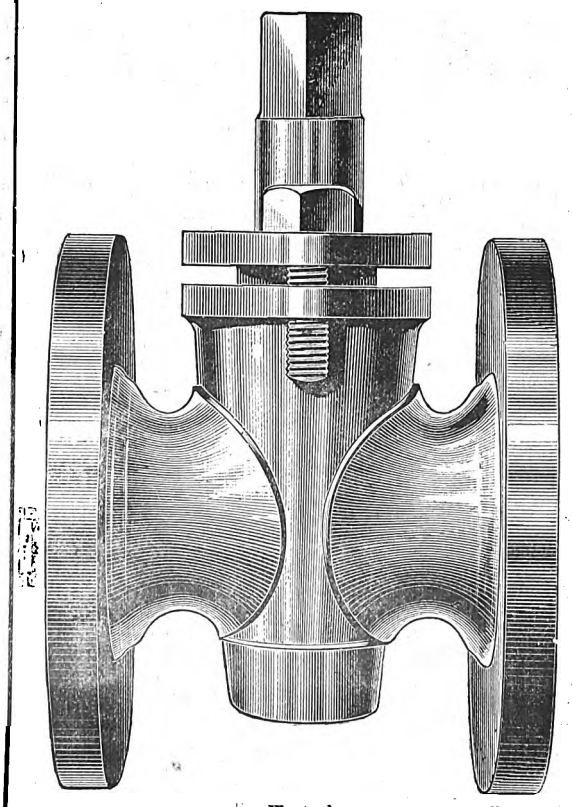
All Valve Stuffing Boxes are packed with Asbestos. All Valves are tested with Steam at 100 lbs. per square inch before leaving the works.

SCREWED ENDS.



No.	Screwed Ends.
¼″	2/-
⅜″	2/3
½″	3/-
¾″	4/6
1″	6/6
1¼″	10/-
1½″	14/-
2″	22/-

FLANGED ENDS.



No.	Flanged Ends.	Diam. of Flange.
½″	4/-	3″
¾″	6/-	3½″
1″	9/-	3¾″
1¼″	12/-	5″
1½″	18/-	5½″
2″	29/-	6½″

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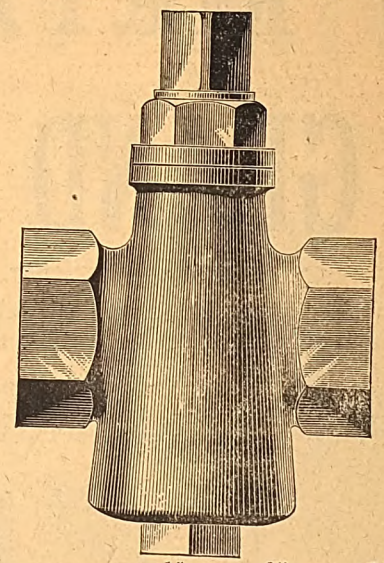
A. E. ALLEN & CO., Engineers, &c., 37, Wellington St., Hull.

IMPROVED PLUG TAPS.

All Valve Stuffing Boxes are packed with Asbestos.

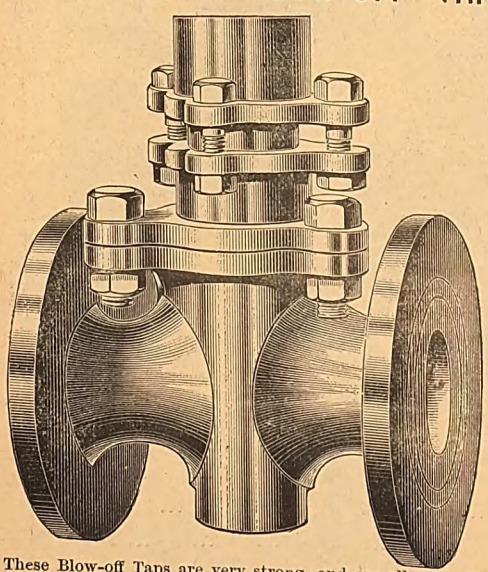


All Valves are tested with Steam at 100 lbs. per square inch before leaving the Works.

SIZE	½″	¾″	1″	1¼″	1½″	2″
PRICE	3/9	5/3	7/6	11/6	14/6	20/-
FLANGED ENDS	4/6	6/9	9/6	14/6	18/6	24/-
DIAMETER OF FLANGE	3″	3½″	3¾″	5″	5½″	6½″

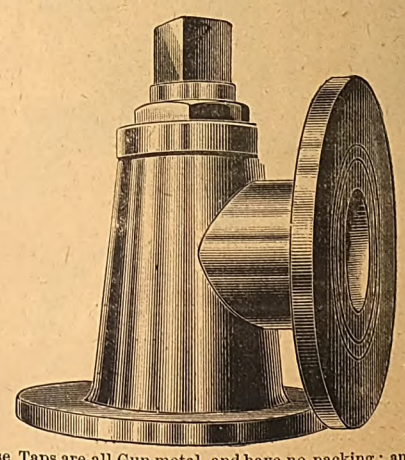
These Taps are made to meet the demand for a common tap, and to do without any packing, and they are very strong, heavy, and durable. All Gun Metal.

DOUBLE GLAND BLOW-OFF TAP.



These Blow-off Taps are very strong, and are all made from Gun-metal. They are of the Compound Gland Principle, and can be packed while under pressure; and are made both with and without the Key Guards, and they are all packed with Asbestos.

NEEDHAM BLOW-OFF TAP



These Taps are all Gun metal, and have no packing; and if the plug should get fast the attendant should loose the nut at the top of plug a quarter of a turn, then strike at the top of plug with a hammer, which will loosen it; then again tighten up the nut, and it will be in working order.

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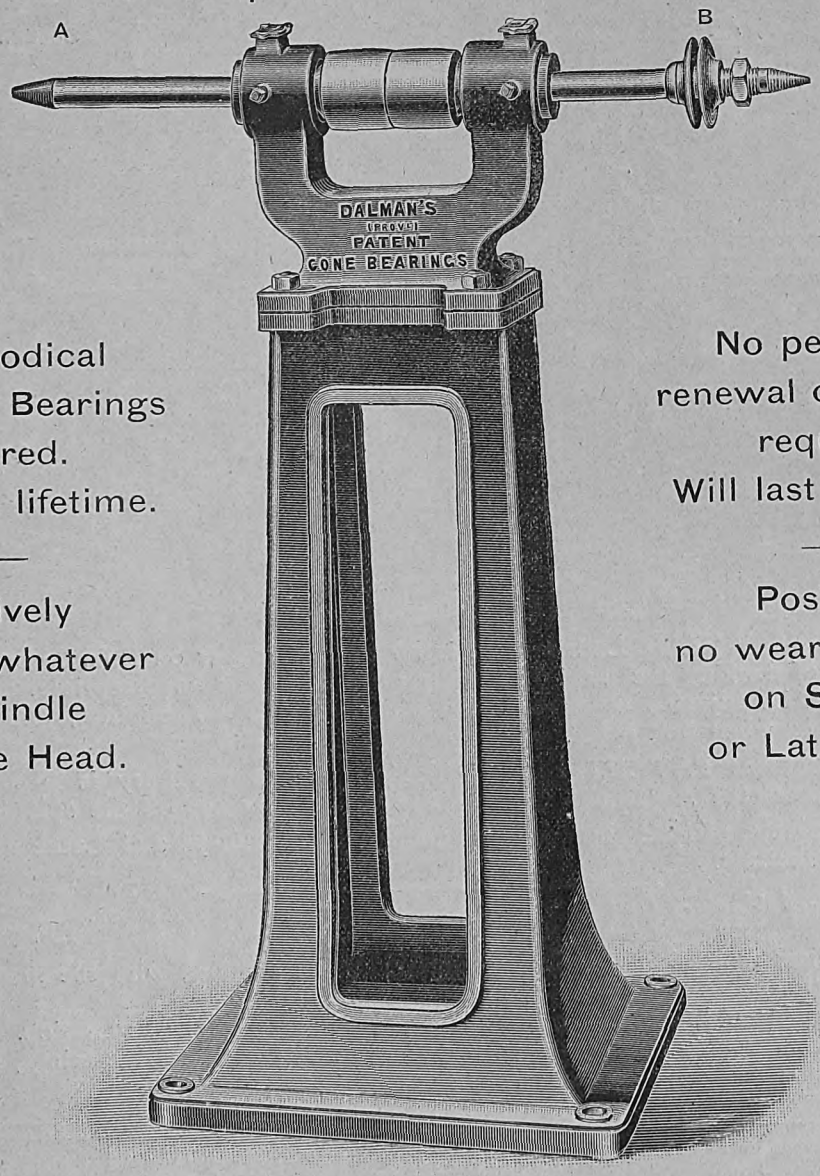
IMPROVED POLISHING LATHES,

WITH

DALMAN'S (PROVL.) PATENT

ADJUSTABLE CONE BEARINGS.

For full particulars see next page.



No periodical renewal of Bearings required. Will last a lifetime.

Positively no wear whatever on Spindle or Lathe Head.

No periodical renewal of Bearings required. Will last a lifetime.

Positively no wear whatever on Spindle or Lathe Head.

PRICES; COMPLETE ON IRON PEDESTALS.

No.	Length and Diameter of Spindle.	Height to Centre of Spindle.	Spindle screwed only as A.	Plates one end as B.	Plates both ends
3	2 ft. 6 in. × 1¼ in.	9 inches	85/-	92/-	99/-
4	3 „ 0 „ × 1¼ „	9 „	90/-	97/-	104/-
5	3 „ 6 „ × 1½ „	12 „	115/-	123/-	131/-
6	4 „ 6 „ × 1½ „	12 „	120/-	128/-	136/-

J. C. DALMAN, Chunk Foundry, River Street, BIRMINGHAM.

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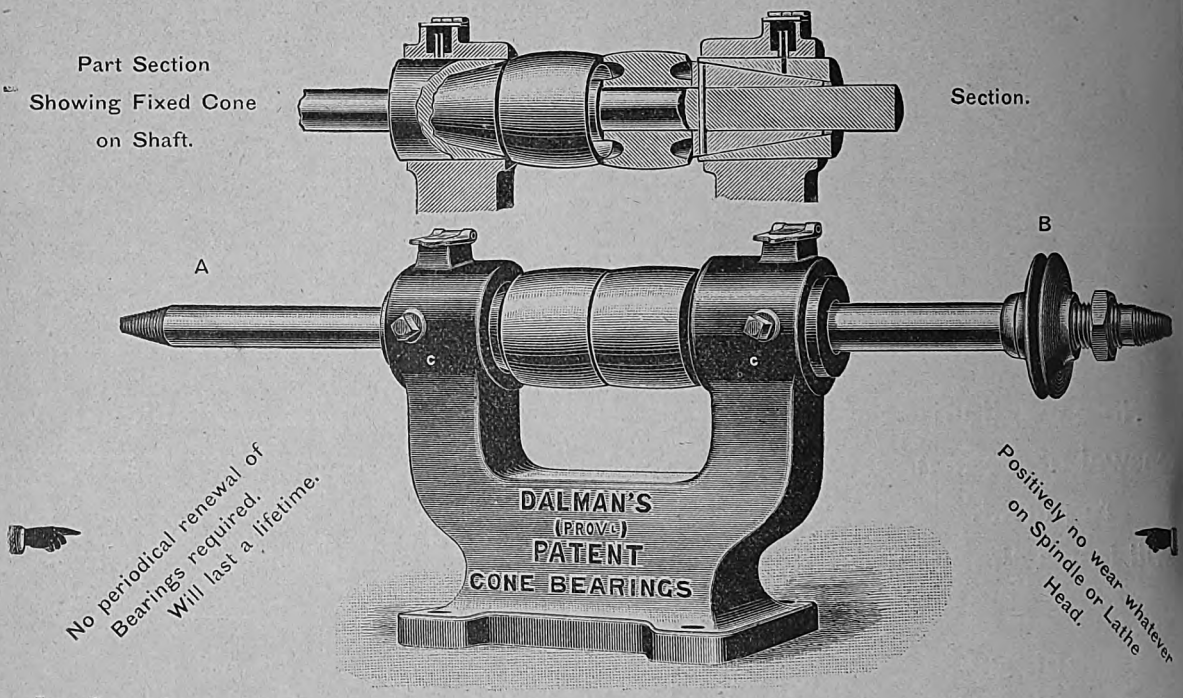
IMPROVED POLISHING LATHES,

WITH

DALMAN'S (PROVL.) PATENT

ADJUSTABLE CONE BEARINGS.



IN these Improved Polishing Lathes there is no wear whatever on Spindle or Lathe Head, and after years of working the wear on the Bearings is almost imperceptible, but what little wear there is can be adjusted by an ordinary workman in a few minutes, and the machine will be as good as when first made.

To adjust these PATENT BEARINGS all that is necessary is to slacken the set screws (C) and press the Adjustable Cones on to the fixed cones on the spindle.

There is plenty of space between the under side of pulleys and Lathe frame for Band running off low shafting.

Advantages of these Patent Bearings over other makes:—

No periodical renewal of Bearings required; those supplied with the machine will last a lifetime.

Perfect steadiness in running of the spindle; no oscillation or vibration.

Friction considerably less than with the ordinary gun metal bearings, and therefore requiring less power to drive.

No.	Length and Diameter of Spindle	Height to Centre of Spindle	PRICES. Spindle screwed only as A	Plates one end as B	Plates both ends
0	1 ft. 0 in. × ½ in.	4 inches	20/-	23/-	26/-
1	1 „ 6 „ × 1 „	6 „	30/-	36/-	42/-
2	2 „ 0 „ × 1 „	6 „	35/-	41/-	47/-
3	2 „ 6 „ × 1¼ „	9 „	50/-	57/-	64/-
4	3 „ 0 „ × 1¼ „	9 „	55/-	62/-	69/-
5	3 „ 6 „ × 1½ „	12 „	70/-	78/-	86/-
6	4 „ 6 „ × 1½ „	12 „	75/-	83/-	91/-

These Bearings can be supplied for other machines, such as Fans, Emery Machines, &c.

J. C. DALMAN, Chunk Foundry, River Street, BIRMINGHAM.

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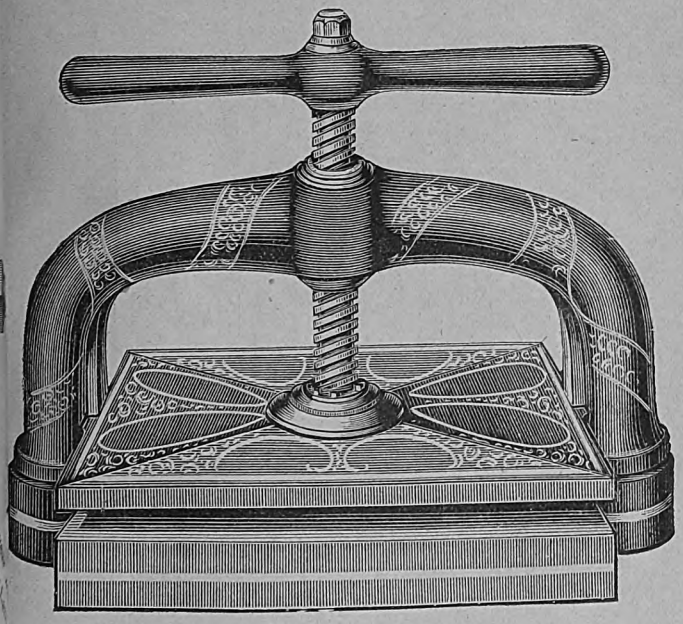
COPYING PRESSES.

From 16/- to 212/-. Complete List and Discounts on application.



No. 59.

Black Japan, Marbled in Gold, Brass Nut on Handle.

Medium Quarto,	12 in. by 10 in.	...	20/–
Foolscap ...	15 in. by 10 in.	....	31/6

No. 59B.

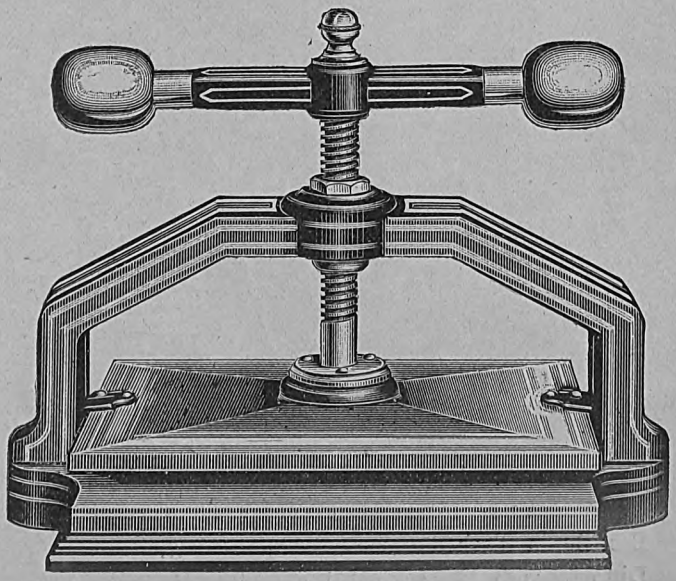
The same as No. 59, but with Brass Ball Handles.

Medium Quarto,	12 in. by 10 in.	...	26/–
Foolscap ...	15 in. by 10 in.	...	38/–

No. 75.

Wrought Iron Beam, Machine Planed Bed and Top Plate, Gun Metal Ball Handles, Washers (on Beam and Plate), Ears (on Plate), and Acorn Knob (on handle). Best Black Japan, Gold Bronzed Fillet, Superior Polish.

Medium Quarto,	12 in. by 10 in.	60/–
Foolscap ...	15 in. by 10 in.	78/–
Post Folio ...	18 in. by 12 in.	110/–
Flat Folio ...	21 in. by 17 in.	197/6
Royal	24 in. by 18 in.	212/–



J. C. DALMAN, Chunk Foundry, River Street, BIRMINGHAM.

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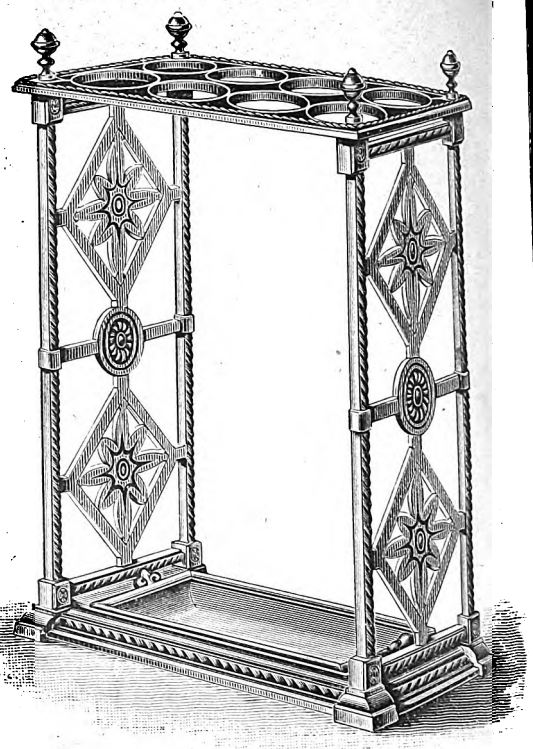
BRONZED IRON RESTAURANT TABLES & UMBRELLA STANDS

Drawings of other patterns and discounts on application.

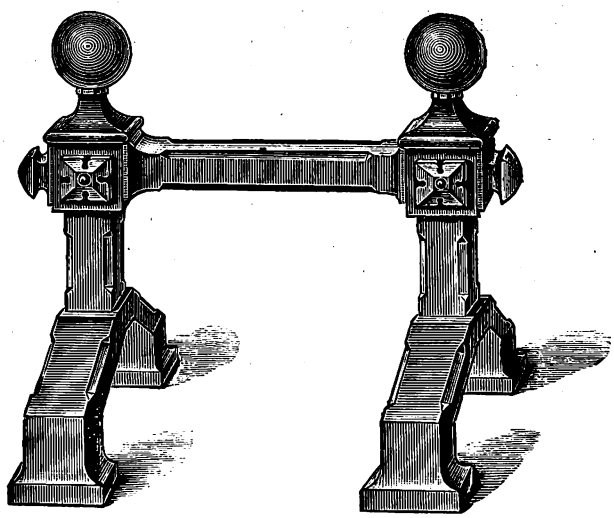
No. 45. Height 29 inches.

Table complete with 24 in. St. Ann's Marble Top 36/0
„ without top 15/9



No. 190. Height, 25½ in.; Width, 18 in.; Depth, 10½ in.
Price ... 12/0

FIRE IRON RESTS.



No. 16.

Size :—Height, 7 in. ; Width, 8 in.
Best Berlin Blacked 9/9
Ditto with Brass Reeded Knobs ... 12/0

No. 43.

Size :—Height, 6½ in. ; Width, 7¼ in.
Best Berlin Blacked 4/6

J. C. DALMAN, Chunk Foundry, River Street, BIRMINGHAM.

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SIX PRIZE MEDALS.

FAST BIND! FAST FIND!

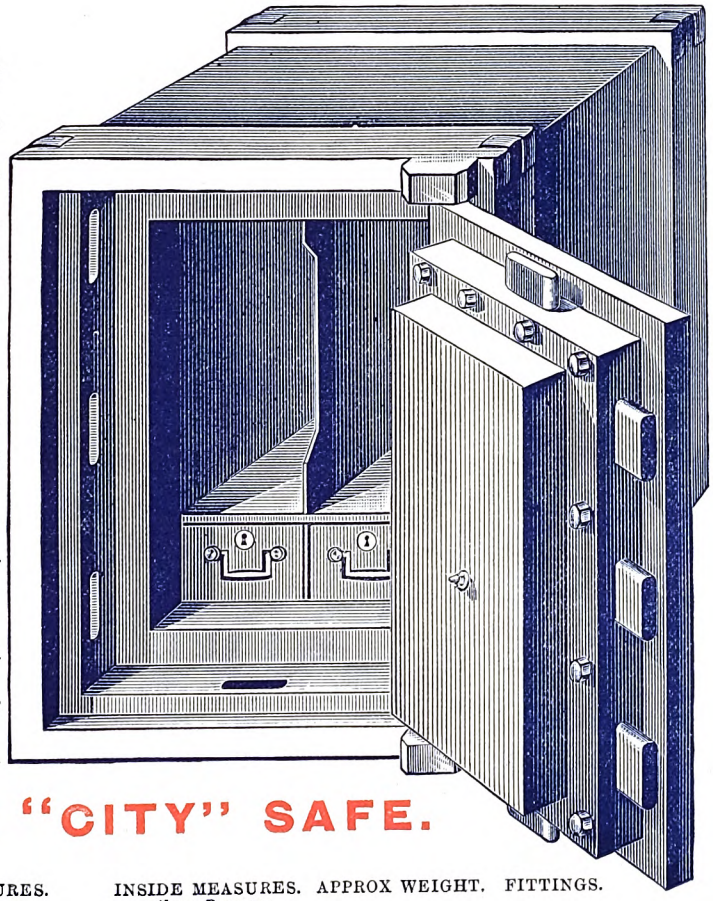
WHITFIELD'S

WROUGHT-IRON FIRE & THIEF-RESISTING SAFE.

SYDNEY, 1879. PARIS, 1878. LONDON, 1851.

MELBOURNE, 1880. ADELAIDE, 1881. CALCUTTA, 1884.

Bodies made of best ¼-in. Boiler Plate, put together with strong Angle Iron, and strengthened with massive Outside Bands. Chambered and filled with Patent Evaporating Composition. Doors, ⅝-in. Solid, hung with centres.



Strong Bolts thrown back and front, and top and bottom, by Brass Handle, into the rebate bars of Safe, and secured with Whitfield's 8-lever Solid Block Lock (2 keys), protected by Hardened Steel Plate, &c.

THE "CITY" SAFE.

OUTSIDE MEASURES. Over Bands. Ins. High.	Ins. Wide.	Ins. Deep.	INSIDE MEASURES. Above Drawers. Ins. High.	Ins. Wide.	Ins. Deep.	APPROX WEIGHT. Cwts.	Qrs.	lbs.	FITTINGS.	PRICE. With Fittings. £	s.	d.	PRICE. Without. £	s.	d.
24	18	18	12 (Above drawer) / 16½ (On clear side)	5	10	4	0	0	1 Drawer half across and Partition	14	0	0	13	12	0
26	20	20	14	12	12	5	0	0	2 Drawers & Partition	15	10	0	14	18	0
28	22	22	16	14	14	5	3	0	2 Drawers & Partition	17	0	0	16	8	0
30	24	22	17½	16	14	6	2	0	2 Drawers & Partition	19	0	0	18	8	0
36	26	24	Above Drawers 19½ / Above Shelf 4	18	16	8	0	0	2 Drawers, Partition, and Shelf	22	0	0	21	5	0
42	28	26	Above Drawers 23½ / Above Shelf 6	20	18	10	1	0	2 Drawers, Partition, and Shelf	27	5	0	26	10	0
48	30	26	Above Drawers 22½ / Above Shelf 12	22	18	12	0	0	2 Drawers, Partition, and Shelf	31	10	0	30	15	0
54	30	26	Above Drawers 20 / Below Drawers 20	22	18	13	2	0	2 Drawers in centre, Partition above and below	35	0	0	34	3	0

F. WHITFIELD & Co.,

66, HOLBORN VIADUCT, LONDON, E.C. 52a, OXFORD-ST., BIRMINGHAM.

SIX PRIZE MEDALS.

PRICE LISTS OF "SICKER" AND OTHER SAFES FREE ON APPLICATION.

Your attention is especially called to this Safe, our latest improvement, which, for Quality, Finish and Price, is unequalled.

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SIX PRIZE MEDALS.

FAST BIND! FAST FIND!

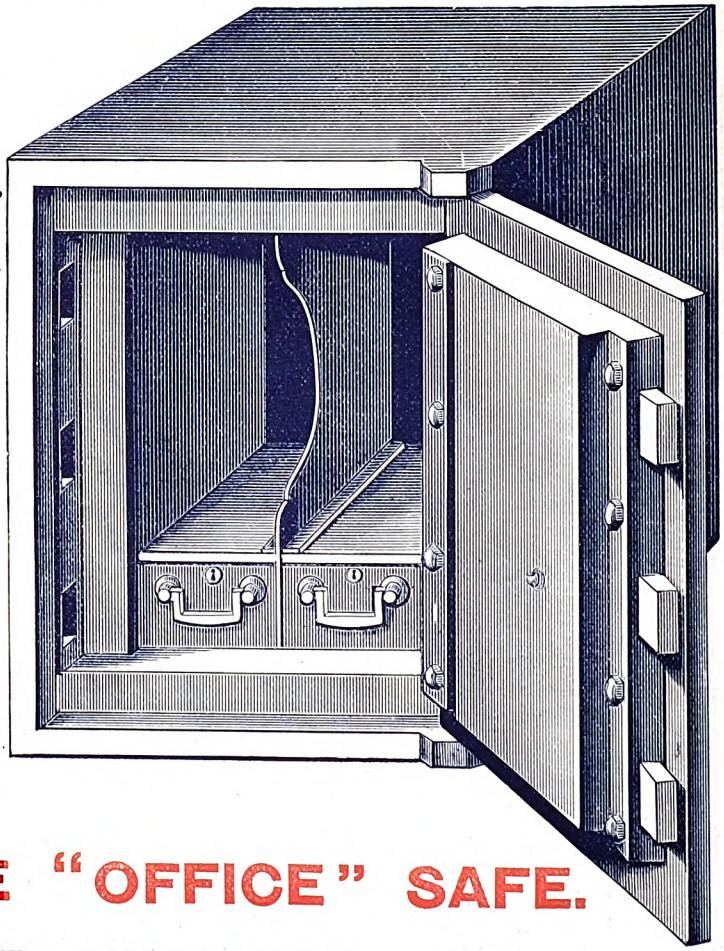
WHITFIELD'S

WROUGHT-IRON FIRE-RESISTING SAFE.

Front of casing on bolt side set back, and bolts thrown by brass handle through angle iron lock case, into Bar, and not into casing, as usual with cheap safes.

Body made of Best Wrought Iron, 3-in. Fire-resisting Chambers, Door Plate 7-16-in.

If fitted with Whitfield's Patent Lock, 13/6 extra.



Bolts secured with Lever Lock (two keys), Brass Label and Escutcheon.

If fitted with Outside Bands, 3 × ½-in. at front, and 3 × ⅜-in. at back, 15 % gross extra.

THE "OFFICE" SAFE.

OUTSIDE MEASURE. *High. Wide. Deep.*	INSIDE MEASURE. *Above Drawers.*	WEIGHT. *Cwt. grs. lbs.*	PRICE. £ s. d.	FITTINGS.
24 „ 18 „ 18	13¾ × 5¾ × 11 (*Above Drawer*) 18 „ 5¾ „ 11	2 1 0 (*on clear side*)	7 0 0	1 Drawer half across and Partition.
26 „ 20 „ 20	15½ „ 14 „ 13	2 3 17	8 2 6	2 Drawers and Partition.
28 „ 22 „ 22	17 „ 16 „ 15	3 1 14	8 16 0	2 Ditto ditto.
30 „ 24 „ 22	19 „ 17¾ „ 15	3 3 7	9 12 6	2 Ditto ditto.
33 „ 24 „ 24	22 „ 17¾ „ 17	4 2 10	10 18 0	2 Ditto ditto.
36 „ 24 „ 24	25 „ 17¾ „ 17	4 3 14	11 12 0	2 Drawers and Partition, with Movable Shelf, 6-in. from top.

SYDNEY, 1879. PARIS, 1878. LONDON, 1851.

MELBOURNE, 1880. ADELAIDE, 1881. CALCUTTA, 1884.

F. WHITFIELD & Co.,

66, HOLBORN VIADUCT, LONDON, E.C. 52a, OXFORD-ST., BIRMINGHAM.

SIX PRIZE MEDALS.

PRICE LISTS OF "SICKER" AND OTHER SAFES FREE ON APPLICATION.

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Gold
Silver
Bronze
MEDALS.

H. & C. DAVIS & Co

Honourable Mentions too numerous to specify.

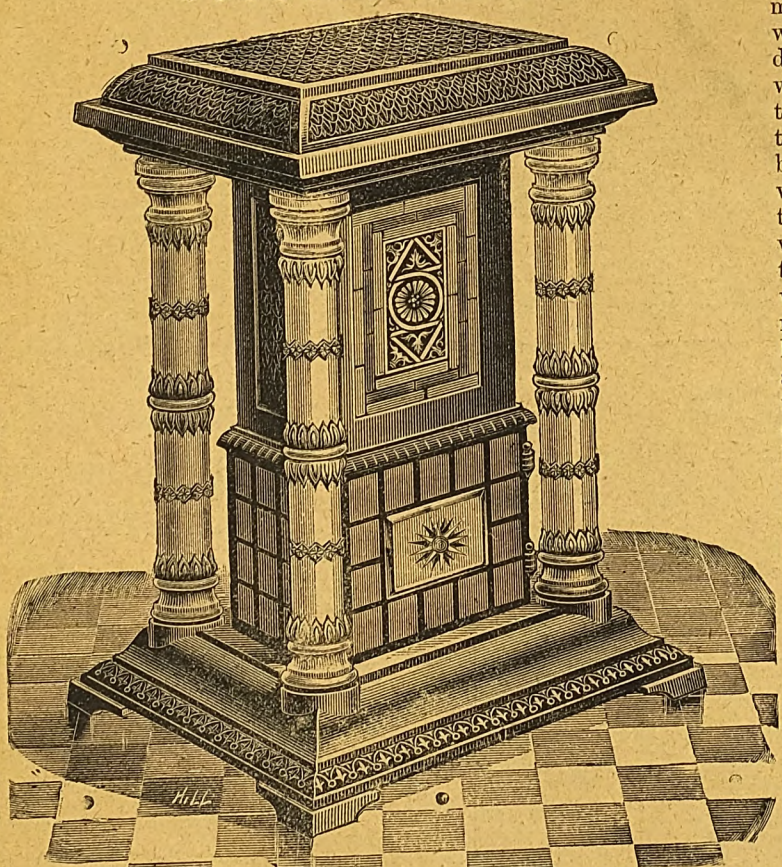
GAS APPARATUS ENGINEERS,

"Metropolitan" Engineering Works, CAMBERWELL RD., LONDON, S.E.

anufacturers of the well-known "METROPOLITAN" series of Gas Kitcheners, to be found in most ouseholds in the Metropolis, as well as of the larger apparatus required for Hospitals, Hotels, Restaurants, Workhouses and all large Establishments where numbers are catered for.

ARTISTIC HEATING STOVES.

Extracted from "The Caterer," October Issue, 1888.



artistic and highly icient stove for heating rposes, especially adapted halls, corridors, foyers, ., has just come before r notice, the manufac-ers being Messrs. H. d C. Davis and Co., of mberwell, who have ently taken new show-oms at 59, Queen Vic-ria Street, City, to enable tending purchasers to ex-ine their appliances thout paying a special sit to the works. Those the hotel and refresh-ent trades on the look-t for a really useful and ndsome stove at mode-te cost will find it well orth their while to ex-xamine the type here epicted. In shape and rinciple these stoves com-ine the qualities of those onstructed upon the con-ensing plan, with super-eating arrangements. The eat is generated by two owerful Argand burners, idden from view by the tained glass panels in front, hrough which a mellow, cheerful light is transmitted. The heated products of combustion pass upwards into a super-heating chamber, which is provided with a full complement of closed tubes, all set with a slightly upward tendency, the upper one of which leads to the top of the stove. It thus happens that the cold outside air is being constantly drawn inwards and upwards, there to become warmed without vitiation, and discharged in that condition (pure and wholesome) into the apartment or the passage to be heated. The consumed air within the chamber, on the other hand, having duly fulfilled its mission of heating the tubes and crown of the stove, pssses downwards through four lateral pillars, and is condensed in the receptacle at the foot of the stove. As regards external appearances, great care has been bestowed on the symmetrical shape of the appliance, and what with its majolica pillars, open fretwork canopy, inlaid tiles, stained glass panelled centre, and tile mounting at the base in relief, it presents as a whole a particularly pleasing and æsthetic appearance.

No. 1904.

Fitted with two Argand burners and governors, four Majolica pillars, the base Majolica moulding round and coloured tiles in panels back and front. Size 3ft. 6in. by 2ft. 4½in. by 1ft. 10½in. PRICE £12.

Show Rooms: 59, Queen Victoria Street, London, E.C.

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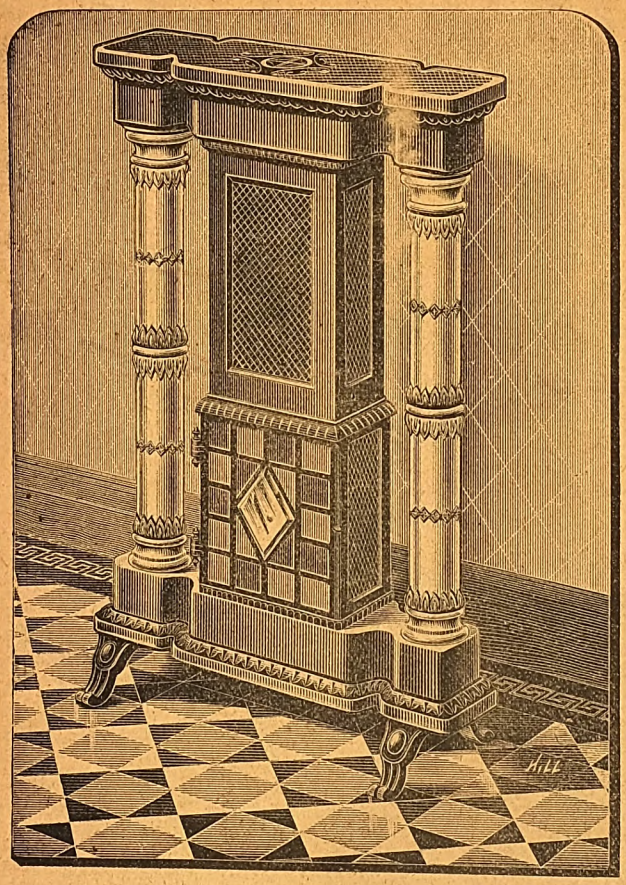
CONDENSING STOVES.



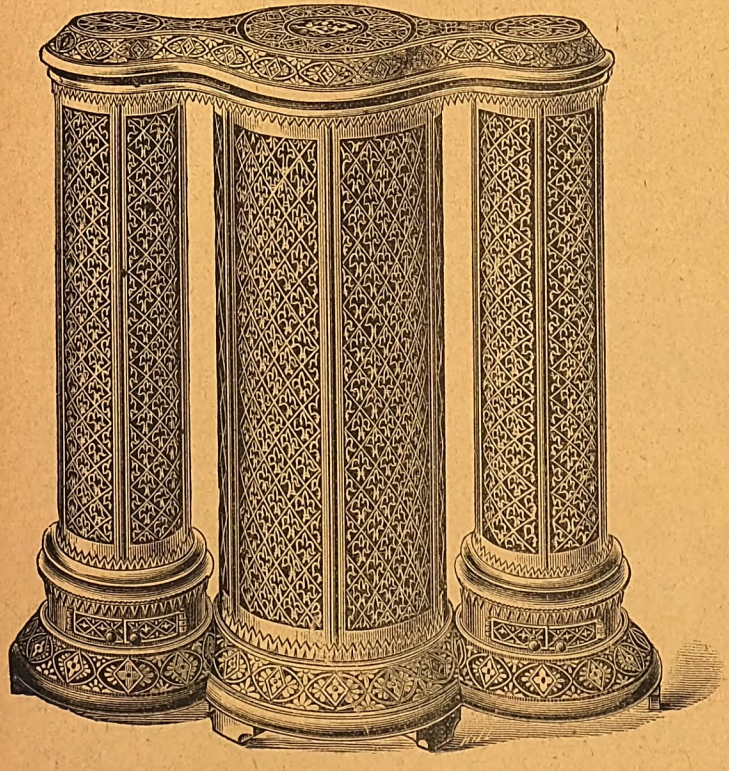
No. 1902.

BEST BERLIN BLACK WITH TWO MAJOLICA PILLARS, STAINED GLASS CASING AND OPEN FRETWORK CANOPY AND BODY

These new and elegant Stoves combine the principles of the Condensing and Super-heating types. The heat is obtained from a powerful Argand Burner fitted with governor in a chamber enclosed in stained glass; the products of combustion then pass into the super-heating chamber filled with crossed tubes; by these means the outer air is being constantly warmed as it passes through, without coming in contact with the burnt air, which latter having duly warmed the pipes and crown of Stove condenses, by passing down the Majolica Pillars, where the contents are received in a pan below.

Size: 3-ft. 6-in × 2-ft. 4½in. × 10-in.

Price £7 10 0



No. 1898.

BERLIN BLACKED, WITH FANCY TILE IN TOP, 2 BURNERS, EACH UNDER SEPARATE CONTROL.

This is a most powerful form of Heating Stove, and no Flue being required, is particularly adapted for School-rooms, Churches, &c., as it will heat a room containing 20,000 cubic feet. It contains in the centre column 27 tubes, and 9 tubes in each of the side columns. The heat ascends the circle of the tubes in the side columns, descends the outer circle of tubes in the centre column, re-ascends the inner circle of tubes in the same column and gradually cooling as it goes, finally returns through the large tube in middle of centre column, where it condenses and is collected in a pan provided for that purpose. If desired, a supply of fresh air may be drawn into the room by connecting an air shaft with either or both of the large tubes in centre of side columns.

Size: 4-ft. high, 4-ft. wide, 2-ft. 2-in. deep.

PRICE £10 10 0

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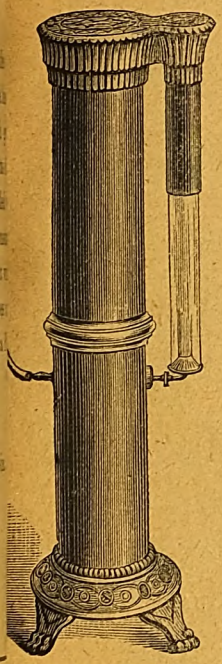
CONDENSING STOVES.

For Offices, Shops, Entrance Halls, Rooms, &c., &c.,

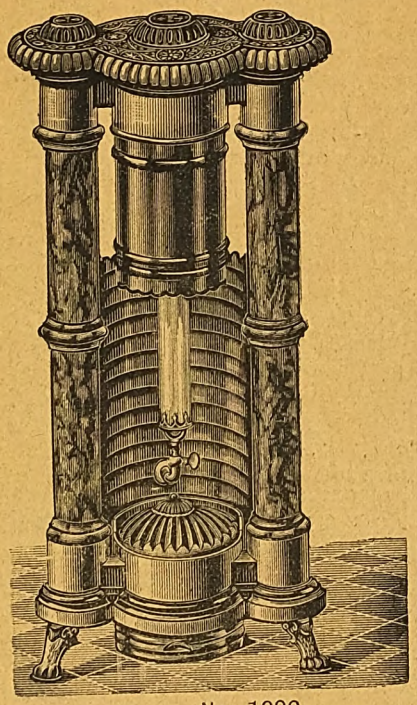
And are perfectly safe for use in Hospitals, Sick Rooms, and Small Conservatories.

NO FLUE PIPE WHATEVER REQUIRED.

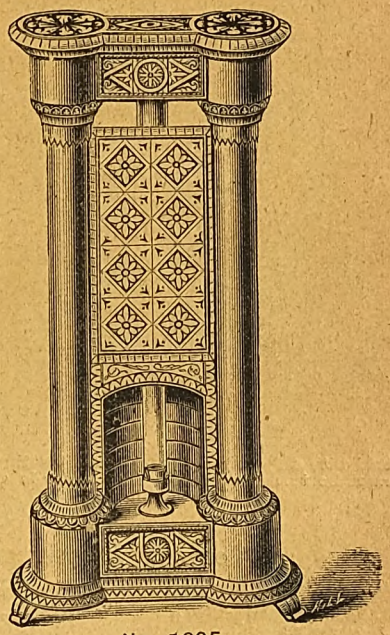
On the gas being lit the hot air and products are compelled to circulate through the descending flues, and in passage impart the heat to the surrounding atmosphere. The products are condensed, and then discharged into tray below in the form of liquid.



No. 1891.



No. 1892.



No. 1895.

No. 6P.S.

is powerful Stove presents a very ıt appearance, and having all the improvements to date, September, will, we feel sure, give unusual ıction. The interior of the centre ın is a multitubular heating chamber, ıg from its construction a constant ation of warmed air, which does not in contact in any way with the Gas.

e base, top, and centre casing are Iron; the heating chamber of stout ıght Iron, Galvanized after construc- Condensing Tubes, Polished Brass; cting Chamber, fitted with Argand, ating Burner and Copper Reflector, er Pan to collect condensation.

42-in. high, 21-in. wide, 16-in. deep.

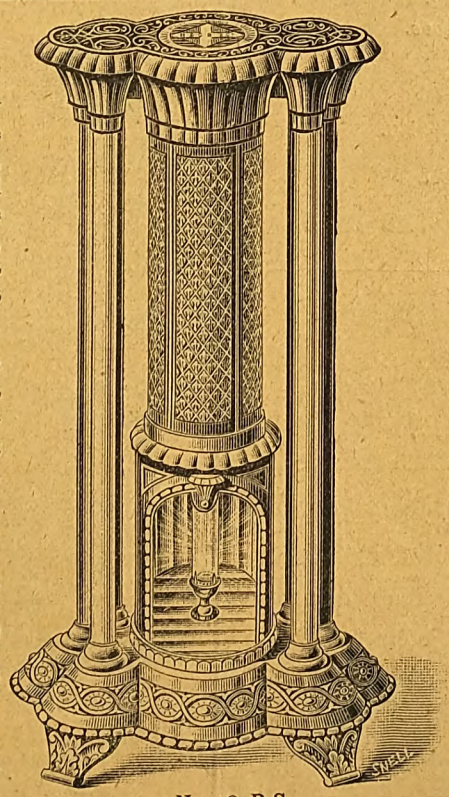
Japanned Black, Price, £4 10 0

Blue Black Enamel „ £5 15 0

verage consumption 8-ft. per hour.

a chimneys), more durable than glass,

Price 3/6.



No. 6 P.S.

No. 1891.	Price.
3-ft. high, Japanned Cast-Iron Pillar, 7-in. diameter; required space, 13-in. by 13-in. ...	2 2 0
If best finished, and with Polished Copper Pillar	2 10 0

No. 1892.	
42-in. high, 17½-in. wide, with Terra Cotta Pillars, loose Ornamental Cast-Iron heat-diffusing Plate, best Governor Burner, Polished Copper Reflector, and Silvered Glass below Burner ...	3 3 0
If with Polished Copper Pillars same price	
Fluted ditto...	15s. extra

No. 1895.	
3-ft. 10-in. high, 1-ft. 7-in. wide, 11-in. deep. Best finished, with Polished Copper Pillars, Polished Copper Reflector, Fancy Tiles in Panelled Front and in Cap and Base, Ornamental heat-diffusing Cast-Iron Cover Plate, and best Governor Burner...	4 10 0

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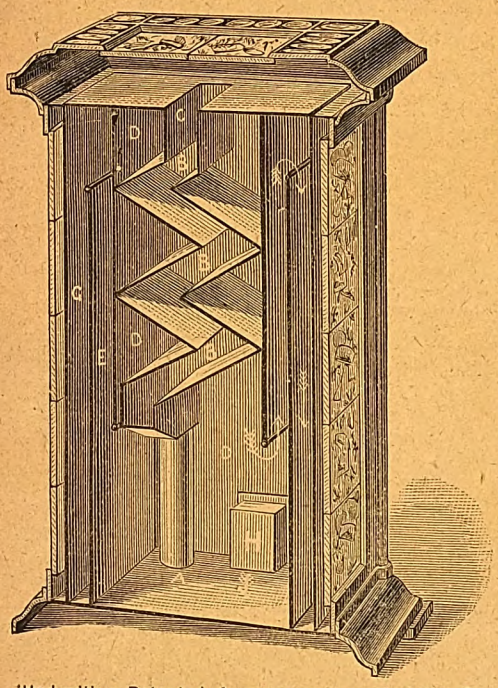
VENTILATING STOVES

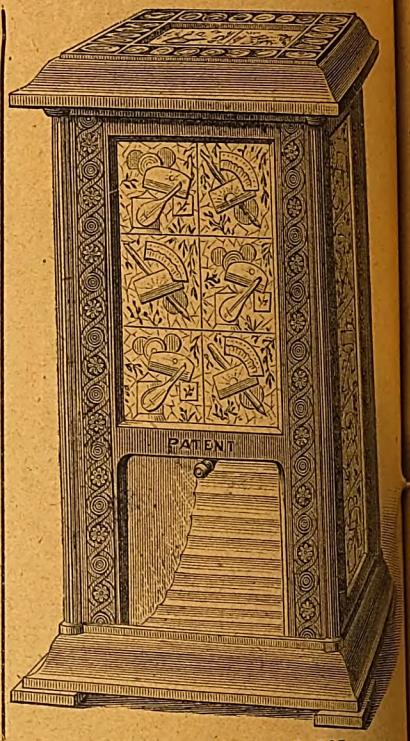
For Warming and Ventilating Halls, Work-rooms, Churches, and other Buildings.

The Thermo-Hygienic (Patent).



itted with a Patented Arrangement so that the Gas cannot be turned on before the Burner is drawn out for lighting.

The interior is so constructed that the greatest amount of heat is extracted from a given quantity of Gas, before the products of combustion are allowed to escape to the outer air. The fresh air is drawn through the Fresh Air Inlet A, and warmed in its passage by passing into the Heating Chamber B (surrounded by the Super-Heating Chamber D). The warmed fresh air rising in the room from the Outlet C causes a large proportion of the air vitiated by breathing to descend, and is then drawn in by the burner in front of A, and carried off by means of the Super-Heating Chamber D to the Ascending Flue E and Descending Flue G to the burnt air Outlet H, thus causing the Stove to be a Disinfector, as the foul air must be burnt by passing through the flames and Super-Heating Chamber.



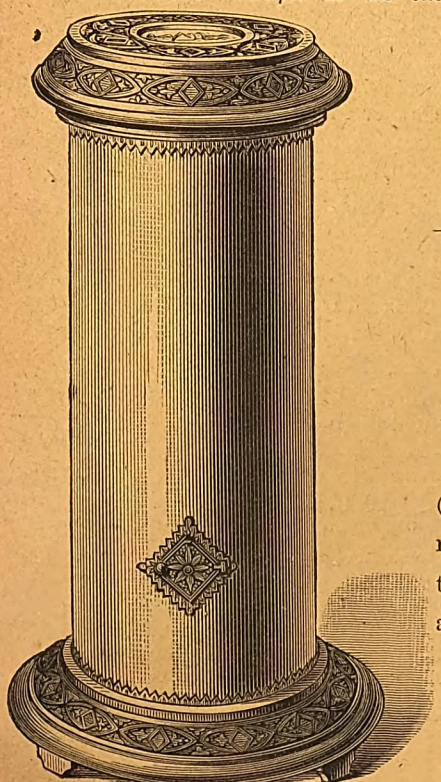
Nos. 333, 334 & 335.

OUTSIDE MEASUREMENTS.	PRICE.
No. 333 2-ft. 5-ins. high, 1-ft. 7-ins. wide, 1-ft. 3½-ins. deep	4 16 0
No. 334 2-ft. 10½-ins. ,, 1-ft. 10-ins. ,, 1-ft. 5½-ins. ,,	6 15 0
No. 335 3-ft. 3½-ins. ,, 2-ft. 0½-ins. ,, 1-ft. 6½-ins. ,,	8 15 6

If Fitted with Fluted Brass Pillars, Brass F... and Ornaments and Extra Quality Tiles, Extra... If fitted with Copper interior, No. 333, 30/-, No. 334, 3... No. 335, 40/-, Extra.

THE CYLINDRICAL.

Same Principle as the one above.



No. 340.

3ft. × 1ft. 10in.

£5 12 6

No. 341.

4ft. × 1ft. 10in.

£6 2 6

Nos. 660 and 661.

(£4 4 0 and 4 10 0 respectively) do not have the Patent Interior, but are fitted with heat diffusing arrangement instead.

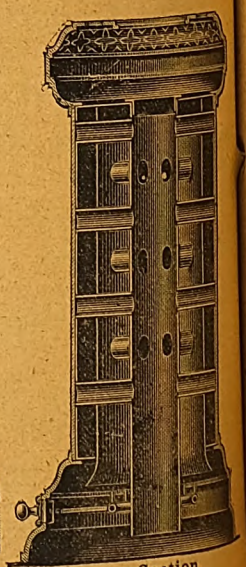
THE MULTITUBULAR.

No. 670.

Fitted with horizontal tubes radiating from vertical centre by which thorough fresh air circulation is secured.

32½in. × 18½in. diam. at base.

£4 10 0.



Section.

No. 671.

49in. × 23in.,

£6 10 0.

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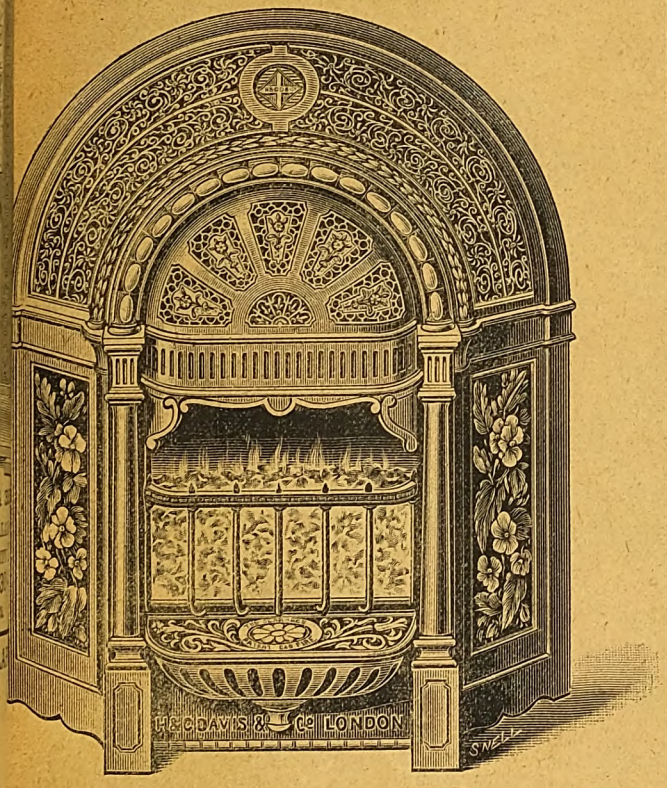
PATENT FUEL FIRES.

These Fires, our most recent make, are specially recommended.

Our new PATENT FUEL is the result of careful consideration as to the substance, and the form of that substance, ost suitable for use with Gas Fires for intercepting and radiating heat, and at the same time presenting a glowing pearance equal to a live coal fire. This ASBESTOS "TREFOIL" FUEL is shaped similar to 3 leaves starting from a mmon centre, is perforated in its 3 sections to enable the flame thoroughly to permeate it, and when the grate is fitted th the pieces, which, from their formation lie closely together, it presents, when alight, a solid incandescent mass, evolving eat heat.

THE "CLARENCE."



This exceedingly handsome fire is of the very latest design and of unique construction.

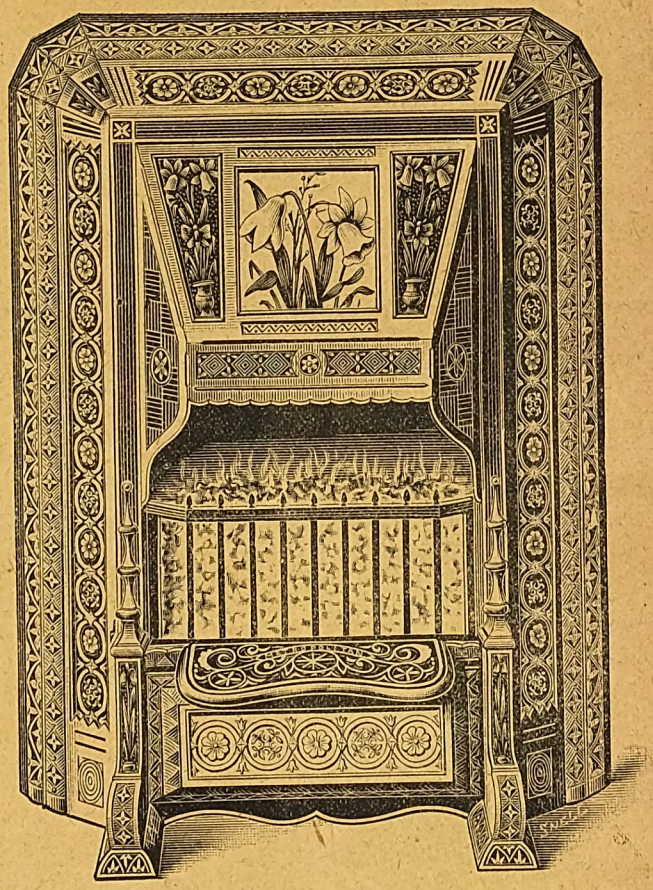
A very stout Cast-Iron Casing, enclosing a corrugated fire brick back (specially adapted for Gas Fires), and an ordinary Cast-Iron Grate front and bottom, is surmounted by a Hollow Fissured Cast-Iron Chamber, ingeniously designed, to retard the passage of the Flame and Hot Air on its way to the flue, and extract the greatest possible amount of heat therefrom.

This interior frame is surrounded by a very elegant outer arched casing, set with elaborate fret-work arch panels and choice tiled side panels, and forms a natural circulating hot air chamber. The canopy over the fire is of open fret-work, matched at the foot with a symmetrical trivet, into which a Boiling Burner can be fitted if necessary.

Size: 30 in. High; 24 in. Wide; 10 in. Deep.
Size of Fire: 11 inches by 9 inches.

Price: £3 15 0.

The LD.



For sizes description of the LD Fire, please refer to page 7, giving the description of the DD Fire.

We have converted this highly popular stove into a Patent Fuel Fire with satisfactory results as to its power and efficiency, but will still continue to make it with Fibre Asbestos for those who prefer that form of fire.

Price: £3 5 0.

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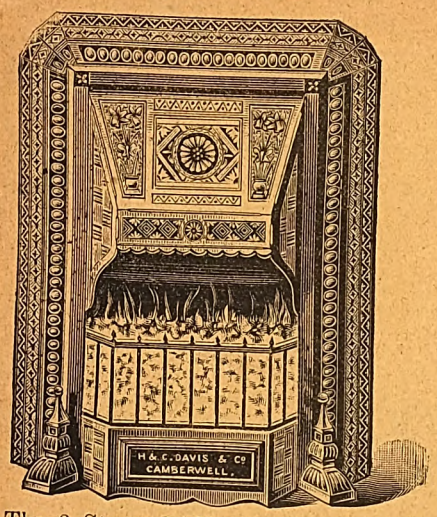
PATENT FUEL FIRES

L.S.N. 1 & 2.



These Stoves and the FSN. are a cheaper form of our new patent fuel fires; every care has been taken to make them equal to a coal fire, and we confidently predict for them a rapid sale.

Sizes.	High.	Wide.	Prices.
LS 1	20½-in.	18½-in.	31/6
LS 2	24½-in.	20½-in	42/-

The 3 Stoves LSN, 1 and 2, and FSN, are also fitted as solid metal fires, and are known as LS 1 and 2 and FS.

Prices as follows:—

LS 1 £1 10 0; LS 2 £2 0 0; FS £1 5 0.

FS Tiled Fender 5/- extra.

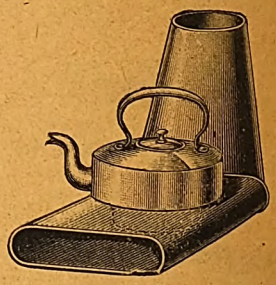
FSN.

Size 17½-in. wide, 17¼-in high.
Fire 10-in. by 8-in. Price 27/6.
Tiled Fenders 5/- extra.

Special Flue Pipe Elbow with Well for Kettle, as shown, arranged for the Stoves above. Price, 0 3 0

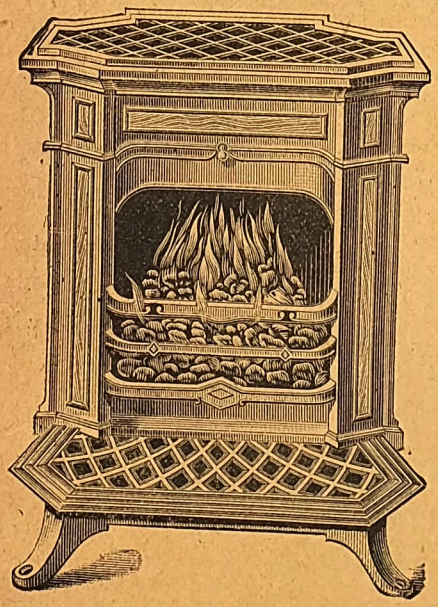
Well Kettle for Ditto 0 2 0

The waste Heat is utilised to boil the Kettle, which it does in 20 minutes full on.



THE CARLYLE.

This is an exceedingly strong and yet very ornamental patent fuel fire. It is made entirely of Cast Iron, with Fire Brick Lining, and proves not only very durable, but gives great satisfaction as to its Heating capabilities.



	Fitted with Gas Fire and Patent Fuel Complete.	For Coal only
No. 0, 16-ins. wide, 20-ins. high, Blackleaded	£2 0 0	£1 2 0
Do. do Black Enamelled	2 15 0	1 13 0
No. 1, 17-ins. wide, 23-ins. high, Blackleaded	2 10 0	1 5 0
Do. do. Black Enamelled	3 5 0	2 2 6
No. 2, 19-ins. wide, 25-ins. high, Blackleaded	3 0 0	1 12 0
Do. do. Black Enamelled	4 4 0	2 16 0
No. 3, 21-ins. wide, 28-ins. high, Black Enamelled	5 5 0	

The Price for the "Carlyle" includes reducing Elbow and length of Flue Pipe.

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FIBRE ASBESTOS FIRES.

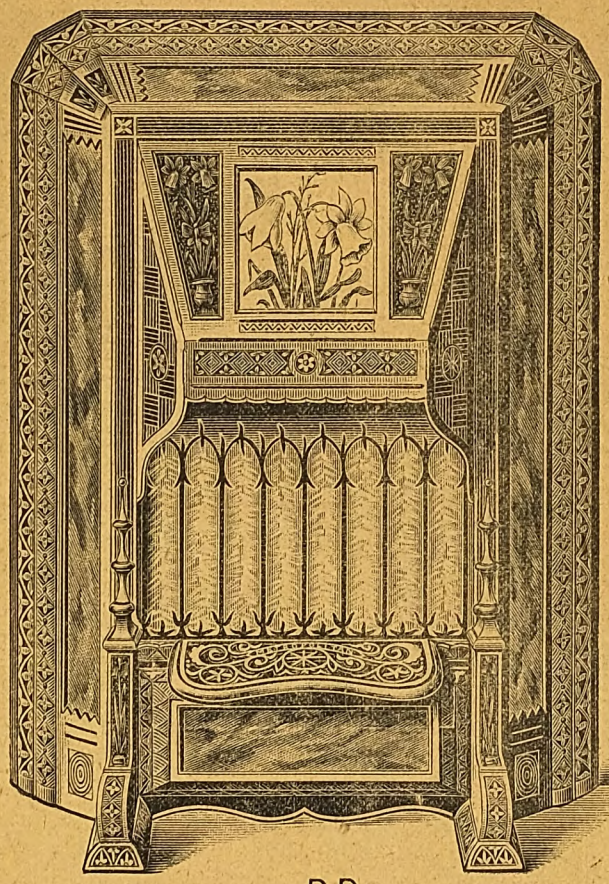
Strongly Recommended.

THE whole series of these fires is fitted with Coloured Glazed Tiles in canopy, top, and side panels, with Nickel-plated Trivets, and Electro-bronzed Fire Dogs.

The back is Radiating Fire-clay, which, owing to its peculiar construction, has double the heating surface of the ordinary tile, and is not liable to fracture. A Heating Chamber is formed by encasing the back with sheet-iron, and the casting in front being perforated causes a circulation of hot air through the room.

They can be fitted, if desired, with Davis's Patent Noiseless Trident Burner, extra as below which produces a continuous sheet of flame, even when the gas is considerably lowered, and will then work at a lower pressure than any Stove yet made.

The "Asbestos Fibre," protected by an ornamental *Grille*, is woven in twisted wire, and can be supplied in lengths for a few pence each, which can be fixed by an inexperienced person should it be necessary to renew it at any time.



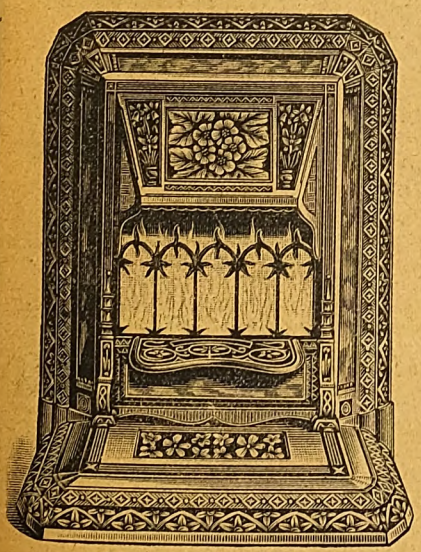
DD

These Fires obtained the Prize Medal at the Sanitary Exhibition, Leicester, 1885, and a Star Certificate Sanitary Exhibition, York.

More than Three Thousand of the DD sold in London alone.

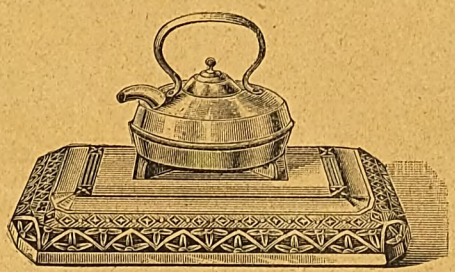
The ABC Series differs from the AA Series in being a little smaller and having plain trivets.

A	16 × 12	15/-
B	20 × 15	20/-
C	24 × 18	30/-



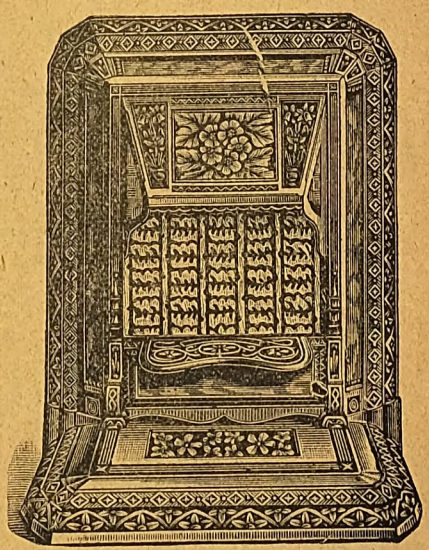
AA BB CC

Incandescent Asbestos Fire.



Tiled Fenders for A A. Price 5s.
B B 7s. C C 9s. D D 12s.

With Boiling Burner in place of Tiles, as shewn above Sizes A A 1/6 extra; other sizes 2/6 extra.



AAM BBM CCM

Metal Curtain Fire.

Round Tin Kettles 2 pts. 1/6; 3 pts. 2s.; 4 pts 2s. 6d.

	Dimensions High	Wide	Size of Fire High	Wide	Will heat a room		Hourly Gas consumption
AA or AAM	16½-in.	by 14½-in	5½in.	by 8½-in.	10-ft. square	20s.	10-ft.
BB „ BBM	20½ „	by 18½ „	7 „	by 11½ „	12-ft. „	30s.	14-ft.
CC „ CCM	24½ „	by 20½ „	8 „	by 13½ „	14-ft. „	40s.	20-ft.
DD	32 „	by 24 „	10½ „	by14½ „	18-ft. „	60s.	24 ft.

Trident Burner extra AA 2/- BB 2/6 CC 3/- DD 3/6. Elbow 1-ft. 6-in. long, to fit any of these Fires 1/6 each

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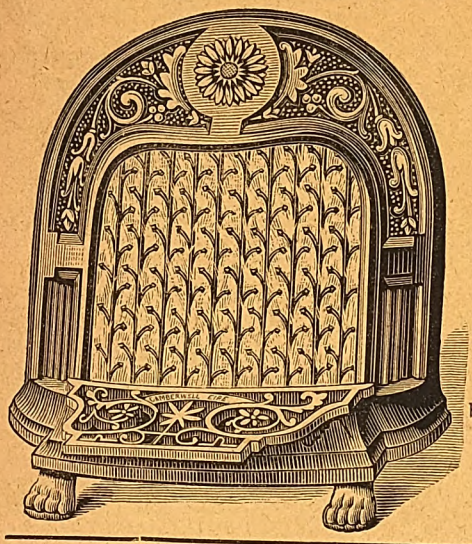
FIBRE ASBESTOS FIRES.



No. 1.

WITH TRIVET,

14 inches wide,
12½ ,, high.
Fire,
10-in. by 6½-in.

PRICE, 12/6.

To hang on bars of Fire Grate, or to stand in Fender.

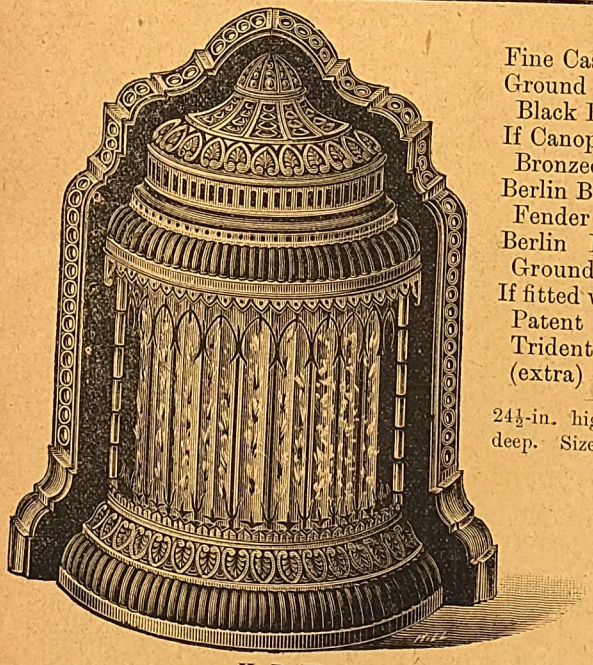
No. 4.

WITH TRIVET,

16 inches wide,
14 ,, high.
Fire,
10-in. by 6½-in.

PRICE, 13/

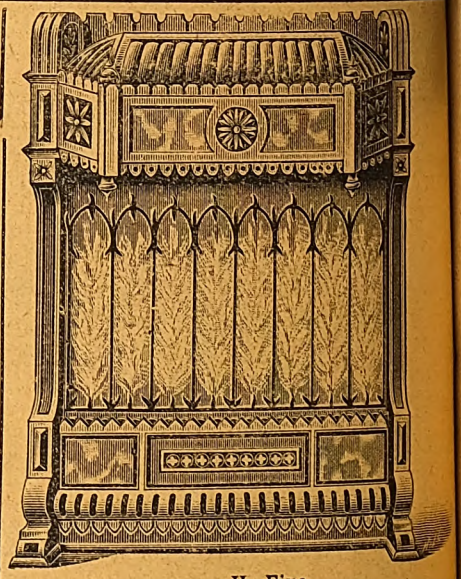
Fenders 2/6 extra.



H. R. Fire.

	PRICE.
Fine Cast ...	£1 15 0
Ground and Berlin Black Enamelled	2 10 0
If Canopy Electro-Bronzed (extra)...	0 10 0
Berlin Black, Tiled Fender ...	0 10 0
Berlin Black and Ground ditto ...	0 19 0
If fitted with Davis' Patent Noiseless Trident Burner (extra)	0 5 0

24½-in. high, 23-in. wide, 8½-in deep. Size of Fire. 18-in. × 9-in. high.

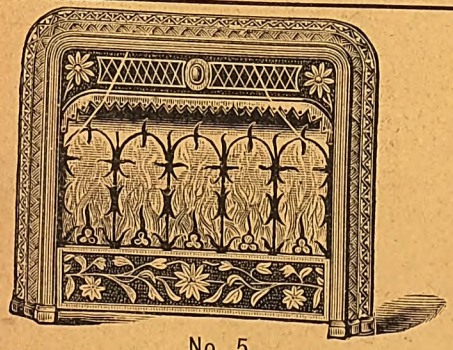


H. Fire.

A very handsome and powerful Stove with fancy tiles in top panels, and polished trivet. 22-in. high, 16½-in. wide, 6-in. deep. Fire, 12-in. wide, 9-in. high.

PRICE, **£1 2s. 6d.**

If fitted with Davis' Patent Trident Burner, £1 5s. 0d.



No. 5.

Fibre Asbestos Fire, with Trivet.

12-in. by 10½-in. Fire, 9-in. by 5½-in.
To hang on bars of fire grate or stand in fender.

Price, 9/-

GAS STOVE KETTLES.

OVAL TIN KETTLE, with flat side towards the fire, for use on the Trivet of a Gas Fire.

2 pints, 1/6.

ROUND COPPER KETTLE, with Copper handle for use on a boiling burner, as sketch.

2 pints, 4/3; 3 pints, 5/3; 4 pints, 6/6.

ROUND COPPER KETTLE, with reeded ebony handle.

2 pints, 5/6; 3 pints, 6/6.

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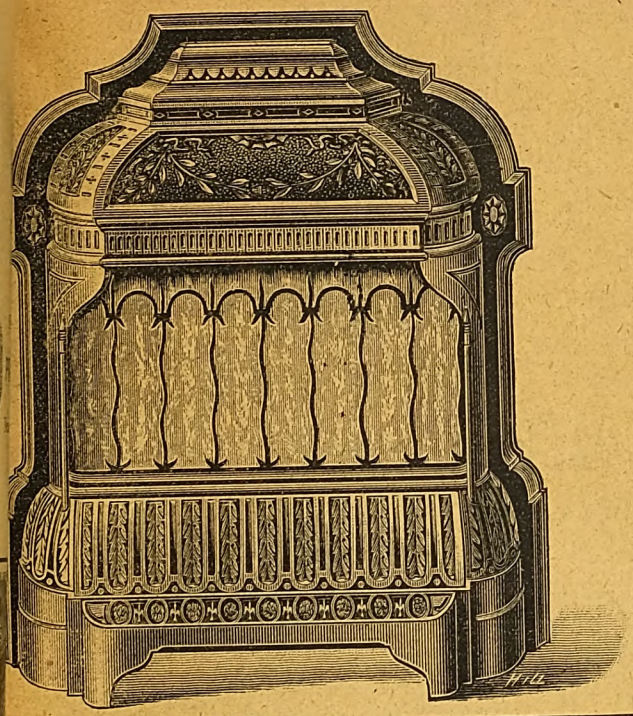
FIBRE ASBESTOS FIRE, No. J.

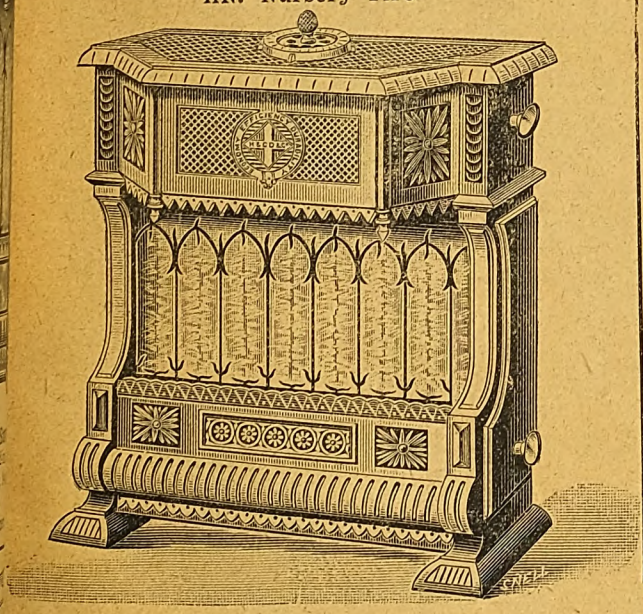


An exceptionally handsome and very powerful Winter Heating Stove.

26½-ins. high, 23½-ins. wide, 6½-ins. deep. Fire 16½-ins. wide by 10-ins. high.

	Price.
Berlin Black - - -	£2 10 0
Berlin Black and Ground - -	3 15 0
Electro-Bronzed - - -	5 15 0
Berlin Black Tiled Fender	0 12 6
Berlin Black and Ground Tiled Fender	1 1 0
Electro-Bronzed Fender - -	2 10 0

HN. Nursery Fire.



Latest Design with Boiling Burner on top, to facilitate RAPID boiling, or can be used for boiling Kettle when the Gas Fire is not in use.

Size, 21-in. high × 16-in. wide × 6½-in. deep.

Fire opening 10-in. by 7½-in.

Price 35/-. With Trident Burner, 37/6.

With hole for Kettle, fitted with Trident Burner,

19/-

If fitted with Patent Trefoil Fuel.

22/6.

16-in. high, 17-in. wide. Fire, 9-in. by 8-in.

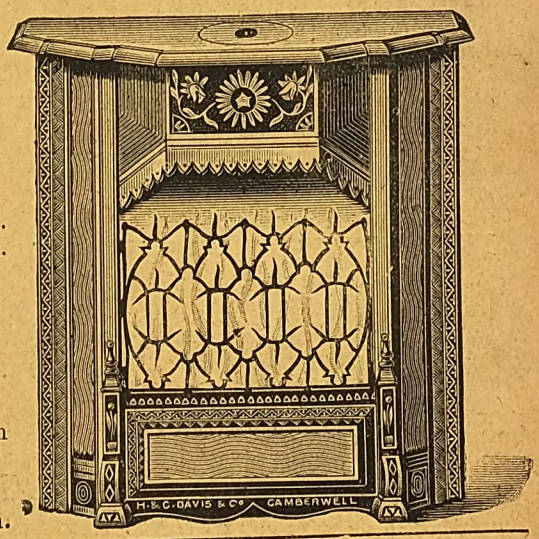
Tiled Fender or Stand, 5/- extra.

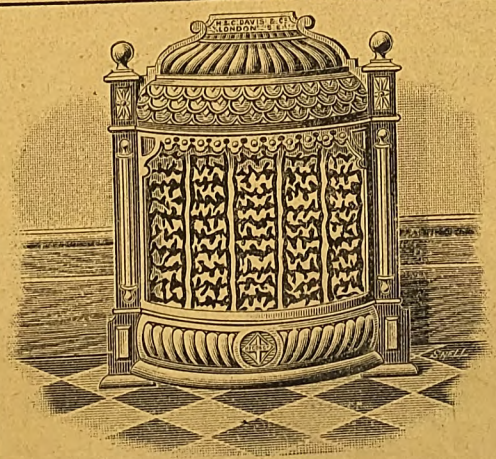
TIN KETTLE,

With Well Bottom to fit in hole at top of N Stove.

3 pints, 3/6 each.

No. N. Fibre Asbestos Fire for Nursery.





METAL FIRE,

RS. 1.

This Stove has been specially designed for heating small rooms, and can either be fitted in the grate of a register stove, or on the hearth, and can be easily moved from room to room. 15-in high, 12-in. wide.

Price 17/6.

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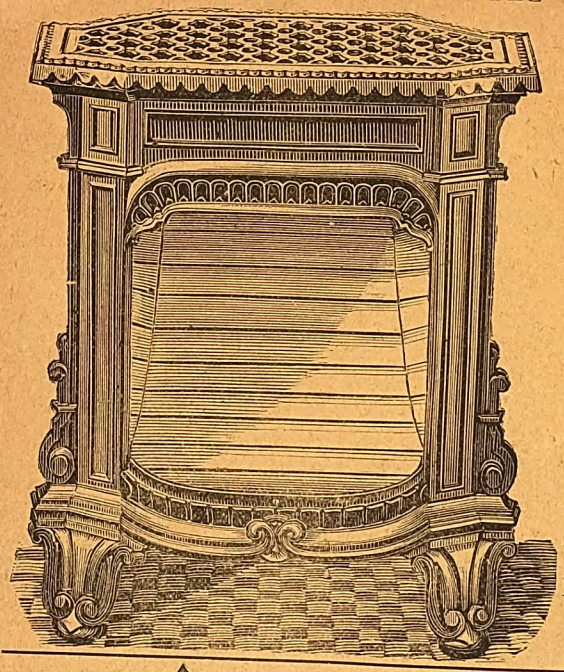


Cheerful Heating Stove

With Movable Top.

No.

406, 19½-in high, 16½-in. wide—

	Black-leaded.	Enamelled.
Price	£1 15	£2 5

407, 22-in. by 18-in.

Price	£2 2	£2 12

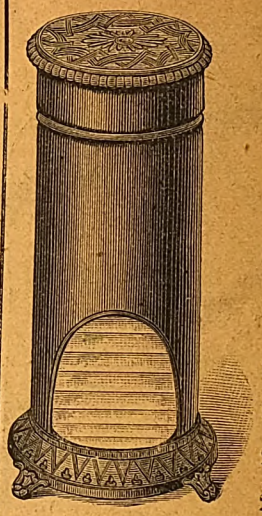
408, 24-in. by 20½-in.

Price	£2 5	£2 17

409, 26-in. by 22-in.

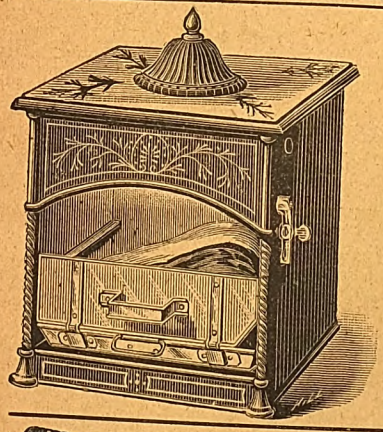
Price	£2 10	£3 5

CHEERFUL HEATING STOVES



With Polished C... Reflector, and Cast ... Internal Cone, to ... heating surface, and F... Cast Iron Top and Ba...

NO.	HEIGHT.	DIAM.	P...
25.	17-in.	7-in.	1...
26.	20½-in	8-in.	1...
27.	27-in.	9½-in.	2...



SUMMER AND WINTER STOVE.

501.

With Pan, Gridiron, Fancy Top and Cover, as sketch.

Price 15/-

Size 12-in. high, 10-in. wide, 8-in. deep. Copper Reflector for converting into Heating Stove, 3/6 extra.

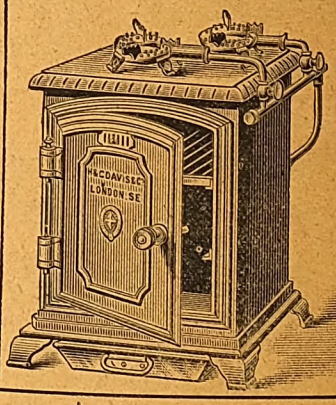
501A.

Similar to above, but with boiling burner on top extra.

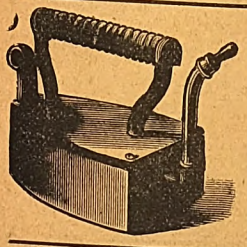
Price 20/-

Copper Reflector, 3/6 3-pt. Tin Kettle, 2/-

Small Kitchener or Portable Oven.



No. 896 ...
21-ins. hi...
12½-ins. wi...
12-ins. de...
Price 30...
With Burne...
Roaster and...
Boiling Burn...
Drip Pan,
Gridiron and
Meat Hook.



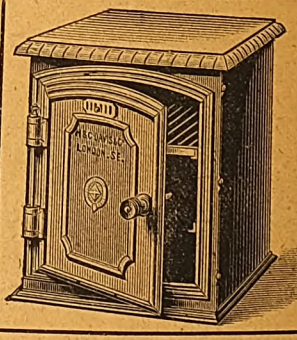
GAS BOX IRON.

No. 380.

COOL HANDLE AND FREE FROM SMOKE.

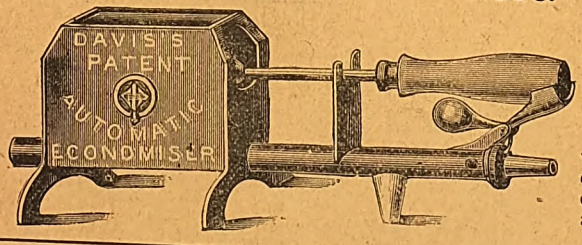
The India Rubber Tubing should be carried from a pendant or chandelier above the work, so as to allow free action. The consumption of Gas is much less than for externally heated Flat Irons.

No. 2	Length of Base, 6-in.	Price ..	9/-
" 3	" " 6¾-in.	" ..	10/-



No. 896 P. ...
15½-ins. high
12½-in. wide
12-in. deep
These handy li... Ovens are a m... useful adjunct... existing Cooking Apparatus; ... be used over a... burner, but a... specially design... for our C 6 Gri... and D 1 Hot Pla...
Price 12/6

Copper-Bit Stove.



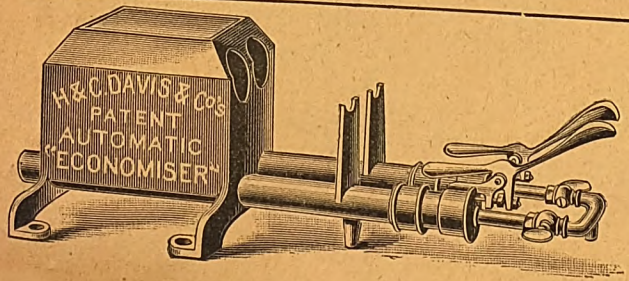
With Loose Cover .. 5/-

With Automatic arrangement as shewn in sketch 7/6

By this arrangement when the "Bit" is withdrawn the Gas is turned down, effecting a saving of at least 75 per cent.

SHOEMAKER'S STOVE.

Price, 2s.



This Double Automatic Copper Bit Stove

Has proved a pronounced success, and is highly recommended by all our customers who have tried it.

Price 20/-

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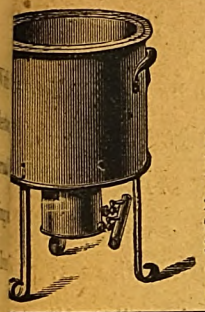
MISCELLANEOUS.

PORTABLE GAS FURNACE,

WITH WROUGHT GALVANIZED IRON PAN.



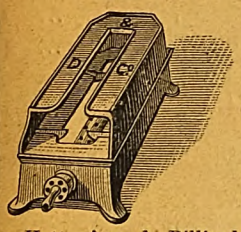
6 Galls.	... ...	30/-
8 ,,	... ...	33/-
10 ,,	with 2 burners	42/-
12 ,,	,,	48/6
16 ,,	,,	55/-
20 ,,	,,	63/-
25 ,,	,,	72/6
30 ,,	,,	92/-
40 ,,	,,	110/-
50 ,,	,,	125/6

Suitable for Laundries, Tea Meetings, Soup Kitchens, Pork Butchers, Ham and Tongue Dealers, Mineral Water Manufacturers, and other purposes.

It requires about 35-ft. of Gas to boil 10 Gallons of Water.

They can also be supplied with draw-off cocks, and with Copper Pans, either tinned or plain, and also double cased and filled in with non-conductor.

LAUNDRY STOVES.

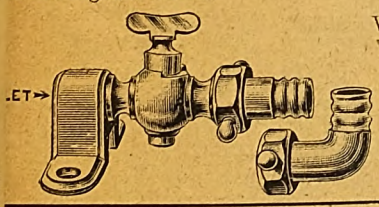


No. 56, for 1 iron without cover	... 4/6
No. 56, for 2 irons without cover	... 10/6
No. 56, for 3 irons without cover	... 15/9
No. 59, for 1 iron with cover	... 5/6
No. 59, for 2 irons with cover	... 12/-
No. 59 for 3 irons with cover	... 18/-

...so Hatters' and Billiard ...ning Stoves. Prices on application.

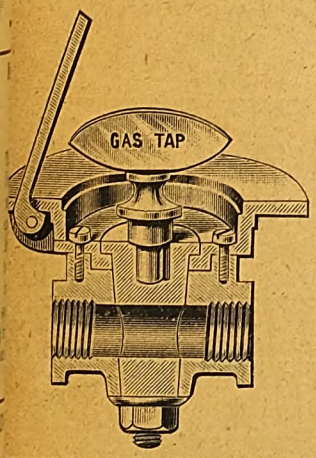
FLOOR COCK (as Sketch).

For use with Gas Fires, Boiling Stoves, &c., can screwed to the floor or skirting board; full re in Plug and Barrel.



With Straight Fly Nut Union, Price 2/3

With Bent do. Price 2/6



FLOOR COCK.

With Loose Key and Indicator Floor Plate, specially designed for Gas Fires where the service is concealed.

PRICES.

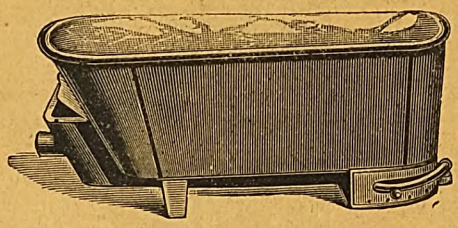
For ¼in. Iron, 3/-

,, ⅜in. ,, 3/9

Wrought Iron Stove Pipe and Elbows.

Piping, 2-ft. Lengths.			Elbows.	
Size.	Black.	Galvanized.	Black.	Galvanized.
1½-ins.	3d. per ft.	6d. per ft.	9d. each.	1/3 each.
2 ,,	3½d. ,,	7d. ,,	10d. ,,	1/3 ,,
2½ ,,	4d. ,,	8d. ,,	10d. ,,	1/4 ,,
3 ,,	4½d. ,,	9d. ,,	1/0 ,,	1/8 ,,
3½ ,,	5d. ,,	10d. ,,	1/0 ,,	1/10 ,,
4 ,,	6d. ,,	1/0 ,,	1/0 ,,	2/0 ,,
4½ ,,	7d. ,,	1/2 ,,	1/3 ,,	2/3 ,,

The "Desideratum" Gas Bath.



Strong Tinned Iron, Japanned White Marble inside and oak outside.

With Double Bottom, and Nozzle for connecting to Flue for carrying away burnt air if required.

With Towel Warmer.

5-ft.	£5 10 0
5-ft. 6-in.	6 0 0
5-ft. with copper bottom ...	6 10 0
5-ft. 6-in. ...	7 0 0

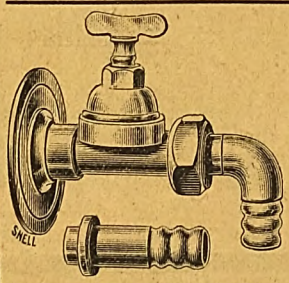
If made entirely of Strong Copper, Japanned White Marble inside, and Green Sienna outside, best finish, with Towel Warmer, and with Connection for Supply, Waste Pipes, etc.—

5-ft. .. £10 10 0 5-ft. 6-ins. .. £11 10 0

Ditto, if made wholly of Strong Polished Copper, Tinned inside, best finished—

5-ft. .. £12 10 0 5-ft. 6-ins. .. £13 10 0

Brass "Carter's" Valves.



Flexible Tube back with Full-way Carter's Valve suitable for small Gas Cooking Stoves or Gas Fires. With this Valve pressure can be regulated with great nicety.

Size.	Price. Bent Union.	Straight Union.
For ¼ Iron	3/6 each.	... 3/- each.

INDIA RUBBER TUBING (Reduced Prices).

	¼-in	5/16in	⅜-in.	½-in	⅝in.	¾in.
Best quality Red or Black, Not Wired, *extra thick*, per foot	3½d	4d.	5d.	8d.	10d.	1/2
Grey... With or without Wire, per foot	2½d.	3d.	3½d.	6d.	8d.	1/0

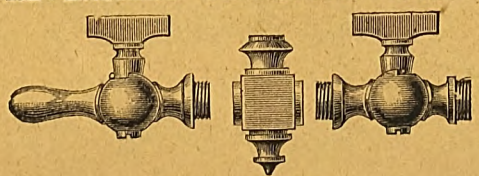
In Coils of 60 feet.

Patent Flexible Gas Tight Tubing.

PRICE 10d. PER FOOT.

Being lined with a Membrane is perfectly impervious to gas. it is braided with Mohair Worsted, of various colours; fitted with Brass connections, and made in two, four, six, eight, ten, and twelve feet lengths.

REVERSIBLE CONNECTOR COCKS.



Price 2/- the Set.

For attaching a Flexible Tube to ordinary Gas Bracket, so that Light or Stove may be used independently of each other.

FLEXIBLE TUBE COCK.

Screwed either internally or externally.

⅜-in. 9d. each.

½-in. 1/6 ,,

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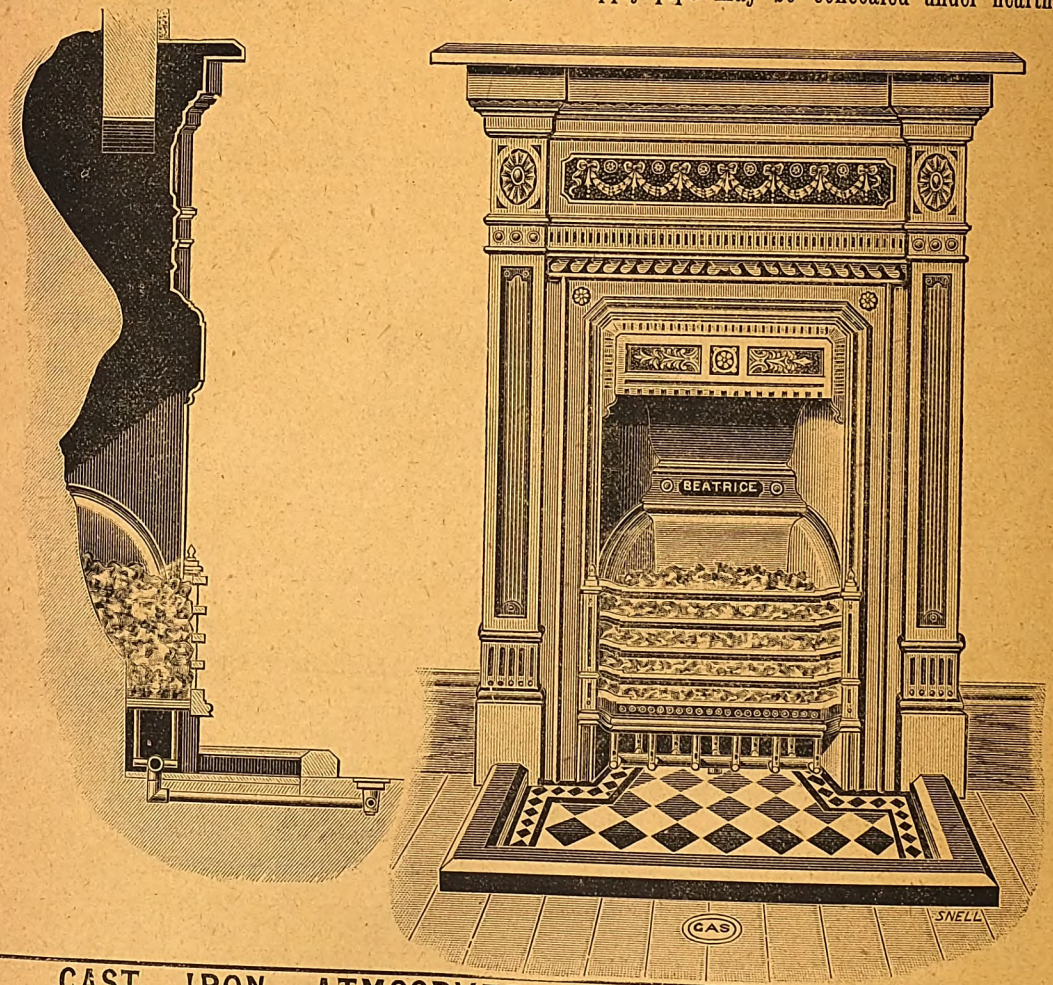
LUMP ASBESTOS GAS FIRES.

This mode of heating rooms by Gas is deservedly popular, as it does not necessitate the introduction of an extraneous article out of keeping with the quality, colour, or conformation of the existing Register Grate. The apparatus is very durable, and the fuel practically indestructible, and our large experience in fitting them up is a safe guarantee that intending customers will be well satisfied should they favour us with an order.

GRATE showing Lump Asbestos Gas Fire Fixed; the supply pipe may be concealed under hearth.



With Brass Finger Burners.

Made to Order to Fit any Fire-place.

6	Burner Fire	...
7	„ „	...
8	„ „	...
9	„ „	...
10	„ „	...
12	„ „	...
14	„ „	...

Other Sizes at Proportionate Prices.

Each Burner on an average requires 1-lb. of Asbestos Fuel and burns 3½-ft. of Gas per hour at 1-in. pressure.

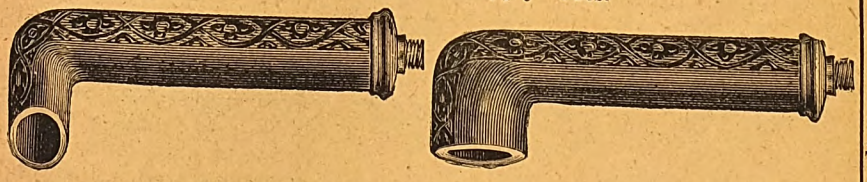
Gas Cock with Fan Key, **2/3**.

Brass Floor Plate, with Hinged Cover to conceal Gas Cock, **1/3**.

When ordering Gas Fires a templet should be taken as follows:—Take a piece of brown paper and cut it to fit the bottom of Grate, rub the finger over it to mark the position of bars in grating, the Apparatus can then be made to fit exactly.

CAST IRON ATMOSPHERIC BURNERS.

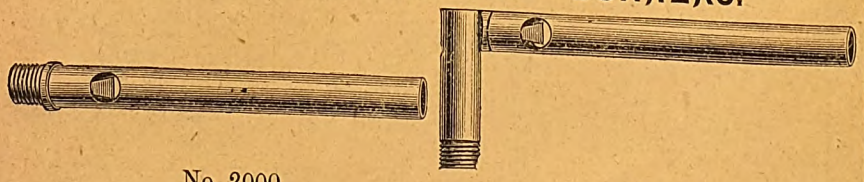
With ⅜-in. Brass Supply Jets.



No. 2002, Vertical, 1/- each.

No. 2002, Horizontal, 1/-

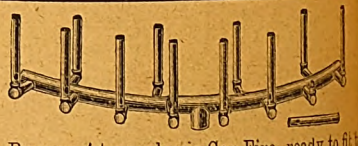
BRASS ATMOSPHERIC BURNERS.



No. 2000.

No. 2001.

	PRICE.	
No. 2000, 7/16-in.	5/-	per dozen.
„ 2001 „	7/6	„

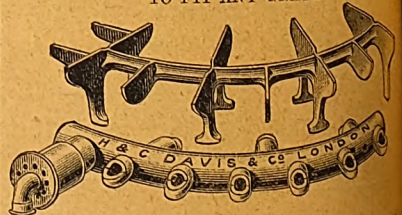


11-Burner Atmospheric Gas Fire, ready to fit to Stove, showing one of the burners detached.

The S.G. PATENT LUMP ASBESTOS BURNER.

With Loose Guard to keep the Fuel off the Burner.

TO FIT ANY GRATE.



Either with vertical or horizontal inlet; in the former case a hole has to be made in the bottom grate of Stove. In ordering it is necessary to state on which hand the inlet is required.

Straight.—For				Curved.			
10in.	12in.	14in.	16in Fires	10in.	12in.	14in.	16in. Fires.
... 8/-	9/-	10/-		7/6	8/-	9/-	10/-

BEST QUALITY ASBESTOS FUEL (WHITE, RED, or BLACK), 6d. per lb. Special Prices for ¼-cwt. Parcels and upwards. BEST SELECTED FIBRE ASBESTOS, 10s. 6d. per lb. ORDINARY, 7s. 6d. per lb. Short Fibre do., for sprinkling over Lump Asbestos Fires, 2/- lb. PATENT "TREFOIL" ASBESTOS FUEL, as used in our Patent Fuel Fires, 8d. per lb.

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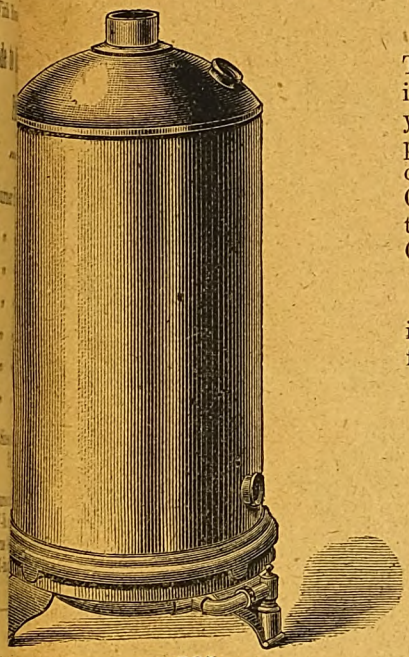
CIRCULATING BOILERS.

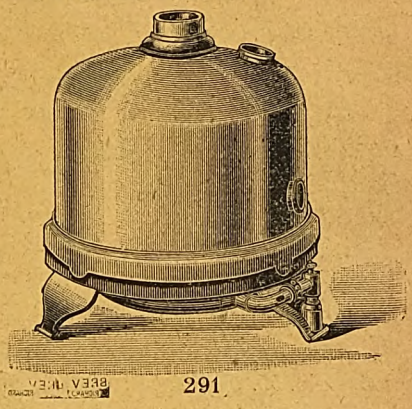
The "Caliente" Patent Indestructible (Strongly Recommended.)



295.

For Greenhouses, and Heating water in Tanks for Household and other purposes, this is the most powerful and efficient Boiler ever yet produced. It is calculated to stand a pressure of 20-lbs to the square inch, and consists of one or more Cast Iron Tubular Cycles with flattened radial Tubes bolted together, and enclosed and bolted to a strong Galvanised Wrought Iron Outer Casing.

As there is no solder used in this Boiler, it will not be materially affected, if left alight for a short time without water.



291

Prices with Stand and Burner complete:—

No.	Diameter of Body	Height from Base to Crown.	To heat	Price.
291	12-ins.	11-ins.	60-ft. 2-in. pipe	£1 15 0
292	,,	14-ins.	120-ft. ,,	2 15 0
293	,,	19-ins.	200-ft. ,,	3 15 0
295	,,	21-ins.	350-ft ,,	4 15 0

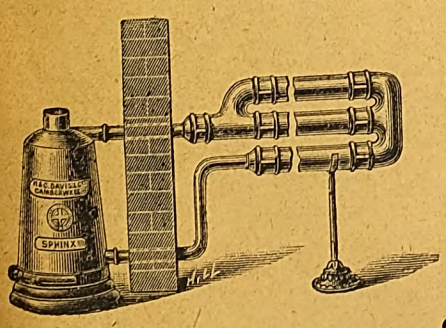
For heating larger quantities of Pipe we make a Double Caliente—a most powerful Boiler, enclosing two of any of the above sizes side by side, within an Oval Casing.

CALIENTE BOILERS. (391 SERIES.)

THE "CALIENTE" BOILERS having been received with much favour, we have decided to bring them out in a smaller form (as space is often a consideration), whilst at the same time not interfering in any way with the qualities of strength, efficiency, and durability possessed by the 291 Series.

No.	Diameter of Body.	Height from Base to Crown.	To heat.	Price.
391	9½-ins.	8½-ins.	40-ft.	£1 10 0
392	,,	10½-ins.	70-ft.	2 5 0
393	,,	12½-ins.	130-ft.	3 0 0
395	,,	16½-ins.	200-ft.	3 10 0

THE "SPHINX" CIRCULATING COPPER BOILER, FOR HEATING CONSERVATORIES, GREENHOUSES, OFFICES, HALLS, &c.



This is the most economical Boiler known for heating water by Gas, which is a very important consideration when Gas is required to be alight for an extended period. The interior consists of corrugated discs, so arranged that in the smallest size Boiler there are nearly 800 inches of heating surface. It will maintain 200 degrees in 20 feet of 3 inch pipe with 7 feet of gas per hour.

No. 193	... 8-in. diameter	...	To heat 30-ft. of 2-in. pipe	... £3 0 0
,, 194	... 9in. do.	...	To heat 100-ft. of 2-in. pipe	... 3 15 0
,, 195	... 10in. do.	...	To heat 150-ft. of 2-in. pipe	... 4 10 0
,, 196	... 12-in. do.	...	To heat 250-ft. of 2-in. pipe	... 5 15 0
,, 197	... 15-in. do.	...	To heat 400-ft. of 2-in. pipe	... 9 0 0

COIL OF PIPES EXTRA.

If placed inside the Green-house, the Flue to carry off the burnt air must be conveyed into a warm chimney; if this is not practicable, the Flue should be carried direct through the roof without bend or elbows, which cause and collect condensation. The Hot Water Pipe must be provided with an Air Vent.

Should it be inconvenient to place the Boiler in the Conservatory it should be protected by using a wood or iron casing and about one foot of Flue Pipe; or placed in an outhouse, and the outlet shielded from the wind.

We can confidently recommend it as a thoroughly Reliable Boiler for the purposes specified. A large number have been supplied to Gas ompanies, Corporations, Architects, Builders, &c., and have given entire satisfaction,

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HOT WATER PIPES AND FITTINGS.

Abridged List.

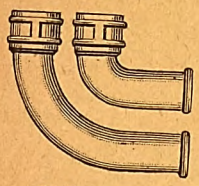
No. 51. Hot Water Pipe.

2 ins. × 3 and 6 ft.; 3 and 4 ins. × 3, 6 and 9 ft.

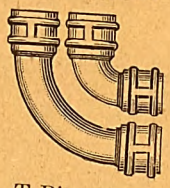
No. 52. Hot Water Coil Pipe.

2 ins. × 3 and 6 ft.; 3 and 4 ins. × 3, 6 and 9 ft.

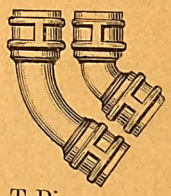
Common Elbows. No. 56. No. 55.



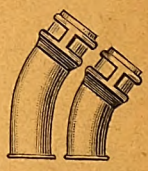
Double Socket Elbows. No. 61. No. 60.



Elbows $\frac{1}{3}$ Circle. No. 65. No. 64.

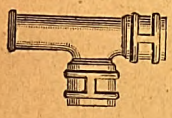


Elbows $\frac{1}{3}$ & $\frac{1}{6}$ Circle. No. 67. No. 66.

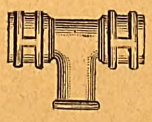


T Piece. No. 77.

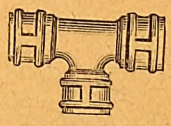
T Piece. No. 78.



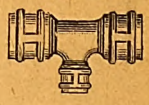
T Piece. No. 82.



T Piece. No. 84



Diminishing T Piece. No. 85.

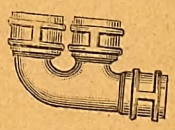


Close Syphon. No. 90.

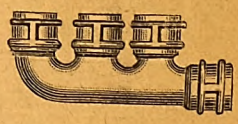
Open Syphon. No. 91.

3-way Syphon. No. 92.

2-way Elbow Syphon. No. 97.



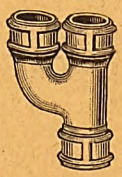
3-way Elbow Syphon. No. 98.



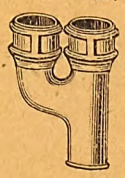
2-way Socket Outlet Syphon. No. 103.

2-way Socket and Spigot Outlet Syphon. No. 104.

2-way Branch Syphon. No. 111.

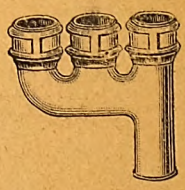


2-way Branch Syphon. No. 111a.



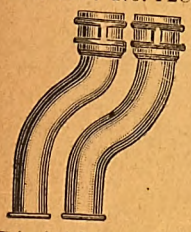
2-way Branch Syphon. No. 112.

3-way Branch Syphon Diminishing Socket. No. 115.

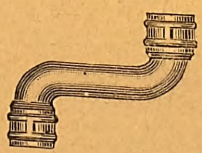


3-way Branch Syphon. No. 116.

Swan Necks. No. 128. No. 128a.



S Pipe or Swan Neck No. 132.



Close H Piece. No. 133.

Open H Piece. No. 134.

Single Valve. No. 141.

Single Valve Spigot & Socket. No. 142.

Diminishing Socket. No. 149.

Diminishing Pipe. No. 150.

Blank Spigot No. 152.

Blank Socket. No. 153.

Sliding Collars

Single. No. 154.

Double. No. 155.

Diminishing Pipes.

No. 156.

No. 157.

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HOT WATER PIPES AND FITTINGS.

	2 in.	3 in.	4 in.	
, Hot Water Pipes, 9 ft.	—	1/10	2/3	per yard.
do. do. 6 ft.	1/4	1/10	2/3	,,
do. do. 3 ft.	1/6	2 0	2/6	,,
dc. Coil Pipes 9 ft.	—	1/10	2/3	,,
do. do. 6 ft.	1/4	1/10	2/3	,,
do. do. 3 ft.	1/6	2/0	2/6	,,
, Common Elbows	1/6	2/6	3/0	each.
, do.	2/8	3/9	5/0	,,
, Double Socket Elbow, Short	2/0	2/9	3/9	,,
, do. do do. Long	3/0	4/0	5/0	,,
, ⅛ Circle Elbow, Short	2/0	3/6	4/6	,,
do. do, Long	3/3	5/0	6/0	,,
, ⅓ and ⅙ Circle do. Short	2/0	3/3	4/3	,,
, do. do. Long	2/6	3/9	5/3	,,
, T Piece	2/6	4/0	5/0	,,
, do.	2/6	4/0	5/0	,,
, do.	2/6	4/0	5/0	,,
, do.	2/6	4/0	5/0	,,
, do. Diminishing 3 in. to 2 in.	—	4/0	—	,,
, do. ,, 4 in. to 2 in.	—	—	5/0	,,
, do. ,, 4 in. to 3 in.	—	—	5/0	,,
, Close Syphon	2/6	3/9	5/0	,,
1, Oppen Ditto	2/6	3/9	5/0	,,
2, 3-way Syphon	4/9	8/3	10/6	,,
7, 2-way Elborw Syphon	4/0	6/9	9/0	,,
8, 3-way do. do.	6/6	10/0	13/6	,,
03, 2-way Socket Outlet do.	4/0	6/6	8/9	,,
04, 2-way Socket and Spigot Outlet do.	4/0	6/6	8/9	,,
11, 2-way Branch Syphon	4/0	6/6	9/0	,,
11a, do. do.	4/0	6/6	9/0	,,
12, do. do.	4/0	6/6	9/0	,,
15, 3-way Branch Syphon, Diminishing Socket 3 in. to 2 in.	—	7/6	—	,,
16, 3-way Branch Syphon	6/6	10/0	13/6	,,
28, Swan Neck, 8 in. offset	3/6	5/6	7/6	,,
28a, do. do.	3/6	5/6	7/6	,,
32, S Pipe or Swan Neck, 12 in. offset	4/0	6/3	8/6	,,
132, do. 9 in. offset	3/6	5/6	8/0	,,
132, do. 6 in. offset	3/0	5/0	7/0	,,
33, Close H Piece	5/3	8/0	11/0	,,
134, Open H Piece	5/3	8/0	11/0	,,
141, Single Valve, Double Socket	11/6	13/6	15/6	,,
142, do. Socket and Spigot	11/6	13/6	15 6	,,
149, Diminishing Socket. 3 in. to 2 in.	—	2/3	—	,,
150, do. Pipe, 3 in. to 2 in.	—	2/0	—	,,
152, Blank Spigot	6d.	9d.	1/6	,,
153, Blank Socket	1/0	1/6	2/0	,,
154, Single Sliding Collar	1/0	1/6	2/0	,,
155, Double do.	1/9	3/0	4/0	,,
156, Diminishing Pipe, 3 in. to 2 in.	—	2/0	—	,,
156, do. do. 4 in. to 2 in.	—	—	2/9	,,
156, do. do 4 in. to 3 in.	—	—	3/9	,,
157, do. do. 3 in. to 2 in.	—	1/9	—	,,
157, do. do. 4 in. to 2 in.	—	—	2/3	,,
157, do. do. 4 in. to 3 in.	—	—	2/6	,,

INDIA RUBBER RINGS FOR JOINING PIPES, 6/ PER LB,

Supply Cisterns and Covers.

Nos.	1	2	3	4	5	6
	6½ × 12 × 9	6½ × 12 × 12	6½ × 15 × 12	8 × 16 × 14	10 × 18 × 16	12 × 20 × 18
	4/0	5/0	6/0	9/0	13/0	17/0 each.

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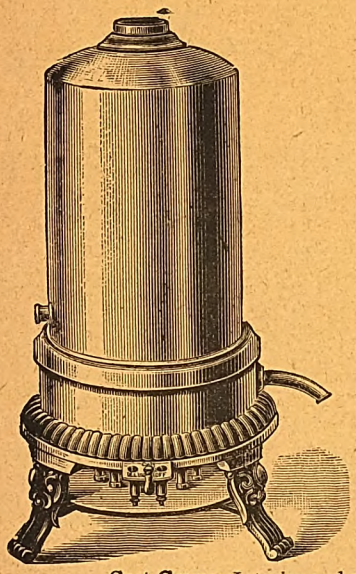
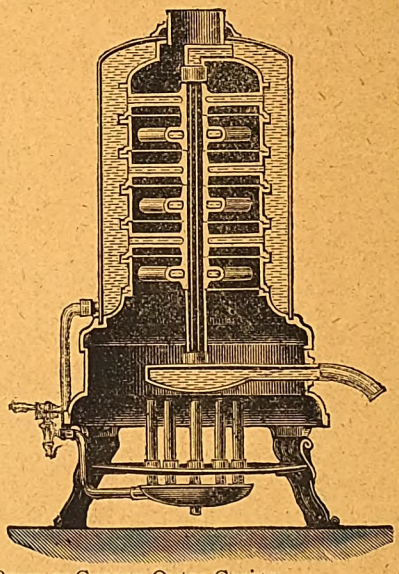
WATER HEATERS.

The Patent "Caliente" Indestructible Rapid Water Heater.

No. 1666.





Cast-Copper Interior and polished Brass or Copper Outer Casing.

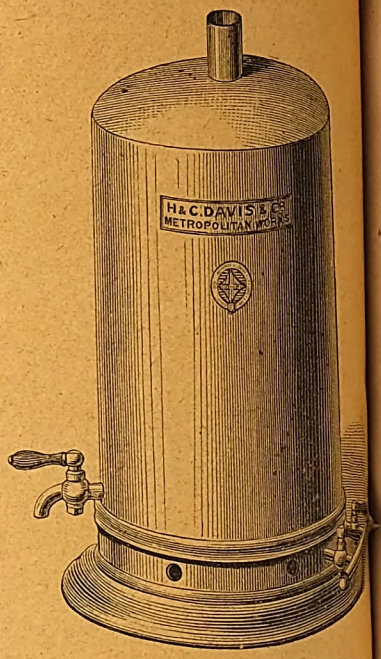
The top and bottom chambers are connected by 3 Vertical Tubes; the cold water enters at bottom of Cylinder, circulates upwards through the Radial Tubes to top of Boiler, then descends by the Vertical Tubes into the corrugated super-heating chamber over Gas burner. The whole of the interior being Cast Copper there is nothing to get out of order. Fitted with a duplex cock by which Gas and Water are turned on simultaneously so that no accident may occur

Will deliver 1½ gallons o water a minute at 100°, with 72 cubic feet of gas per hour.

Price £10 10 0

No. 1,660. A smaller size, in all respects fitted the same, delivering a gallon of water a minute, at 100°. **Price £7 10 0**

The 'Sphinx' Patent Water Heater



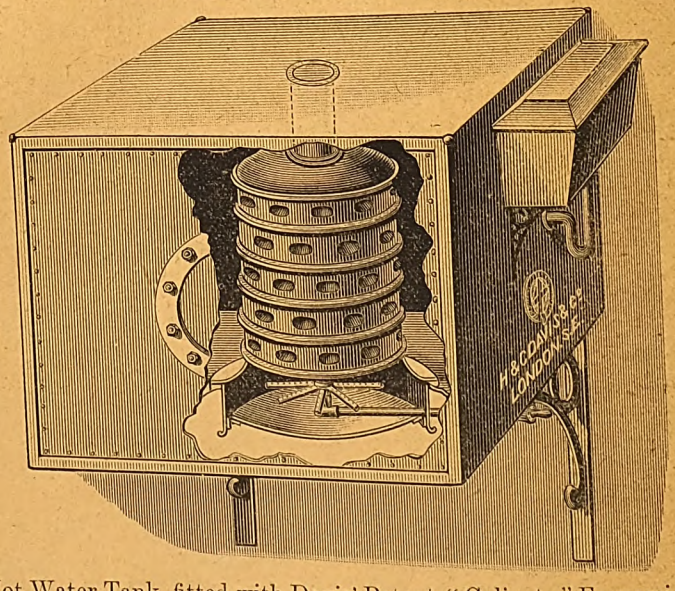
Copper, Japanned outside.

Size	Price
10 gal.	£4 0 0
15 ,, ...	4 13 0
20 ,, ...	5 5 0

Constructed to supply a sufficient body of wa for a Bath, or other purpose, by raising a quantity water speedily to a high temperature.

Requires very little fixing, and can always added to a Bath already fixed with little labour fitting.

PATENT COMBINATION HOT WATER TANK.



Strong Galvanized Rivetted Hot Water Tank, fitted with Davis' Patent "Caliente" Economical Gas Boiler, so that in summer when the kitchen range is not in use, the water can be heated by gas without in any way interfering with the usual connections.

Price, with Brackets, complete (40 gallons) **£10 0 0**

Any Size to Order.

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—— THE ——

GÜLCHER (NEW) ELECTRIC LIGHT & POWER CO.,

LIMITED.

BATTERSEA FOUNDRY, LONDON, S.W.,

SOLE MANUFACTURERS OF THE

Battersea "Hercules" Motor,

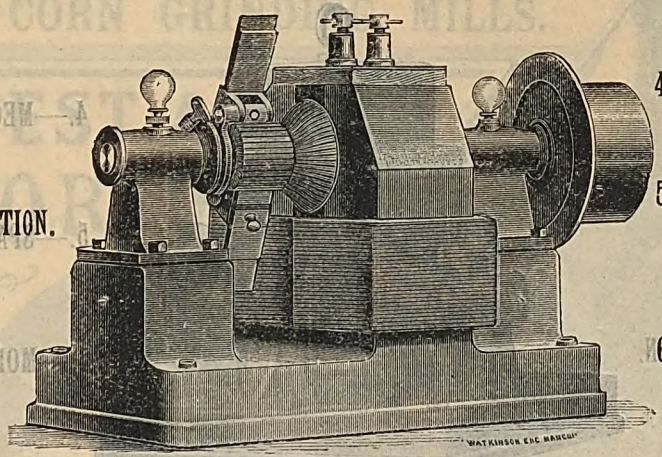
DESIGNED TO MEET THE DEMAND FOR A SMALL HIGH-CLASS MOTOR.

The Special Features of this New Motor are—

1.—LOW PRICE.

2.—SIMPLE CONSTRUCTION.

3.—HIGH EFFICIENCY.



4.—MECHANICAL STRENGTH.

5.—SPARKLESS COMMUTATORS.

6.—LOW SPEED.

THESE MOTORS are specially adapted for haulage, pumping, lifting, working stamps in Gold Mines, driving small machinery at a distance from the motive power, and for other like work.

They are eminently suited for use on yachts, launches, tramcars, or in places where small floor space or little head room is available.

The Machines are constructed throughout of the very best materials, and in designing them no pains have been spared to arrive at the highest possible general excellence. They are made in four sizes only.

Prices.

Power.	Approximate revs. per minute.	Price.	Sliding Beds extra.	Approximate weight.
1-h.p.	2,000	£15 0 0	£1 5 0	120 lbs.
1½-h.p.	1,700	20 0 0	1 10 0	190 ,,
2-h.p.	1,500	27 10 0	1 15 0	300 ,,
3-h.p.	1,300	35 0 0	2 0 0	420 ,,

Standard Winding, 60 Volts and 100 Volts. Compound, Shunt, or Series wound.

For further particulars apply to

THE MANAGER,
Battersea Foundry, Battersea, London, S.W.

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THE

GÜLCHER (NEW) ELECTRIC LIGHT & POWER CO.,

LIMITED.

BATTERSEA FOUNDRY, LONDON, S.W.,

SOLE MANUFACTURERS OF THE

Battersea "Midget" Dynamo,

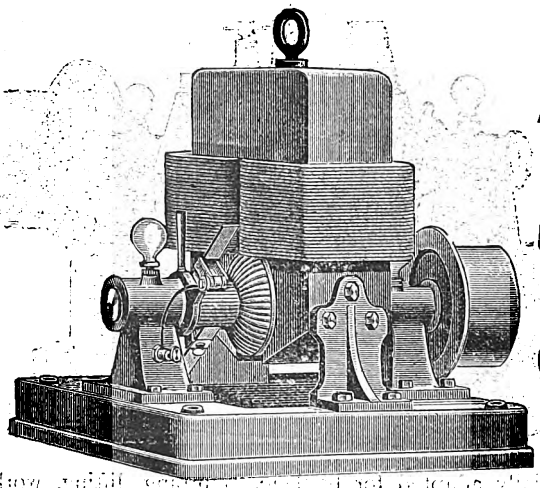
DESIGNED TO MEET THE DEMAND FOR A SMALL HIGH-CLASS DYNAMO.

The Special Features of this New Dynamo are:—

1.—LOW PRICE.

2.—HIGH EFFICIENCY.

3.—SIMPLE CONSTRUCTION.



4.—MECHANICAL STRENGTH.

5.—SPARKLESS COMMUTATORS.

6.—MODERATE SPEED.

THESE Dynamos are adapted for use in private houses; for lighting shops or factories where there is a little spare power; actuating single arc lamps of high candle power, for photographic and other purposes; and generally for use in small electrical installations. They are eminently suited for use with gas or oil engines, and are fitted with special disc-pulleys to ensure steadiness.

The Machines are constructed throughout of the very best materials, and in designing them no pains have been spared to arrive at the highest possible general excellence. They are made in four sizes only.

PRICES.

No. of Lamps.	Approximate revs. per minute.	Price.	Sliding Beds extra.	Disc Pulleys extra.
10 16-c.p.	2,000	£15 0 0	£1 5 0	£0 15 0
20 „	1,700	20 0 0	1 10 0	1 0 0
30 „	1,500	27 10 0	1 15 0	1 10 0
40 „	1,300	35 0 0	2 0 0	1 15 0

Standard Winding, 65 Volts and 105 Volts. Compound, Shunt, or Series wound.

For further particulars apply to

THE MANAGER,

Battersea Foundry, Battersea, London, S.W.

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SEND FOR NEW ILLUSTRATED CATALOGUE OF

BAMFORD'S NEW PATENT

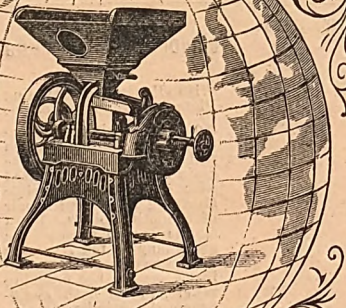
UNEQUALLED FOR FINE GRINDING
H B & S
TRADE MARK

HAVE REVERSIBLE GRINDING PLATES

COLD MEDAL AND FIRST PRIZE

"RAPID" CORN GRINDING MILLS.

BEST ALL THE WORLD OVER



HENRY BAMFORD & SONS.

LEICHTON IRON WORKS,

UTTOXETER.

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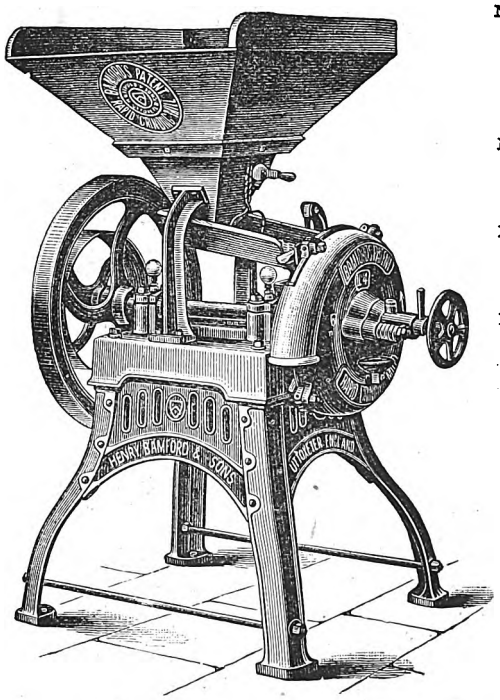
H. BAMFORD & SONS, UTTOXETER.

PATENT "RAPID" CORN GRINDING MILLS, with Reversible Grinding Plates.

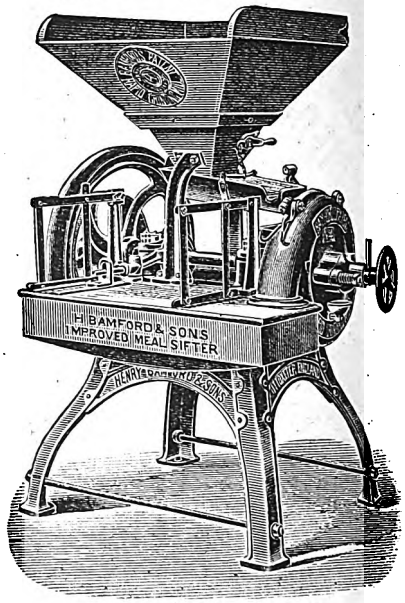


PRICES.

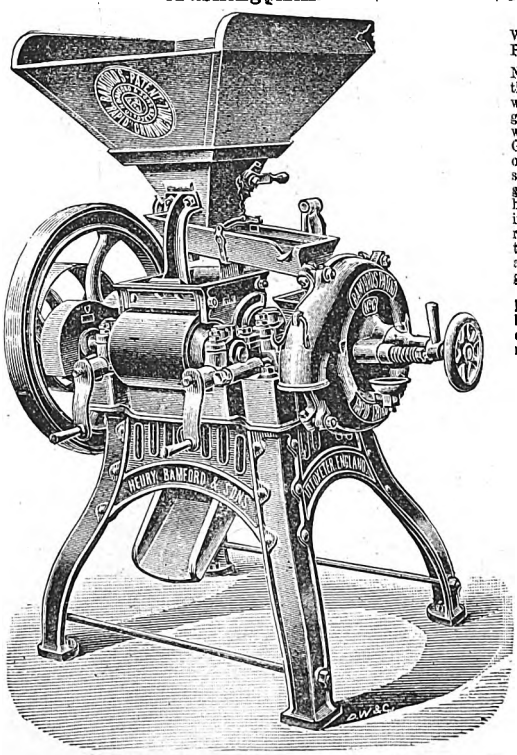
	£	s.	d.
NO. O. MILL, for hand power or suitable for pony gear, with which it will grind 3 to 5 bushels per hour, or kibble at the rate of 10 bushels, with pulley and fly wheel ..	5	17	6
NO. 1 Mill, for 1 or 2 horse power, will grind 5 to 8 bushels per hour, and split or kibble at the rate of 25 bushels	9	0	0
NO. 2 MILL, for 2 or 3-horse gear or steam power, will grind 8 to 10 bushels an hour, and split or kibble at the rate of 35 bushels	11	10	0
NO. 3 MILL, for 3-horse power, will grind 14 to 16 bushels an hour, and split or kibble at the rate of 45 bushels	16	10	0
NO. 4 MILL, for 4-horse power, will grind 16 to 20 bushels an hour, and split or kibble at the rate of 60 bushels	19	10	0
NO. 6 MILL, for 6-horse power, will grind 20 to 30 bushels an hour, and split or kibble at the rate of 80 to 100 bushels	27	10	0
Improved Meal Separator, Extra	3	10	0
Improved Dressing Machine, suitable for above Mills	10	0	0

The Grinding Plates are reversible, and new ones only cost a few shillings.

"Rapid" Mill, with Meal Sifter.



New Patent "Rapid" Grinding and Crushing Mill.



NEW PATENT "RAPID"

GRINDING AND CRUSHING MILL,

With Reversible Grinding Plates and Smooth Rollers.

No. 3 C.—This is an entirely new Machine, which will either grind or bruise grain as desired, it is fitted with our Patent Reversible Grinding Discs, and a pair of Smooth Rollers. By a simple arrangement the grain may be fed from the hopper to either the grinding discs or the crushing rollers, or to both simultaneously, grinding maize and bruising oats or other grain at the same time.

For 4 H.P. will grind 14 to 16 bushels per hour, and bruise a similar quantity of oats. Speed, 400 to 500 revolutions per minute.

PRICE .. £22 10 0.

NEW PATENT "RAPID"

DOUBLE GRINDING MILL,

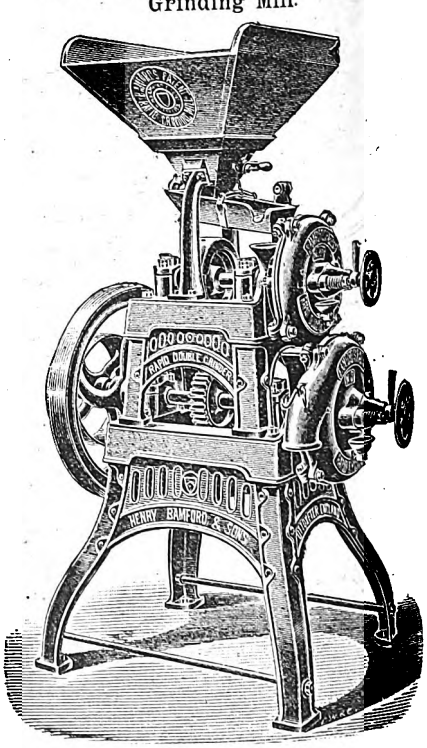
With two sets Reversible Grinding Plates.

No. 3D.—This Patent Double Mill is an entirely new Machine. It has the advantage of a double set of Reversible Discs, by which a gradual reduction of the grain is made, with little extra power, and a very fine and even sample of meal is produced, in every way equal to that ground by mill stones.

For 4 H.P. will grind 14 to 16 bushels per hour, and split or kibble 45 bushels per hour. Speed, 400 to 500 revolutions per minute.

PRICE .. £24 10 0.

New Patent "Rapid" Double Grinding Mill.



THESE MILLS ARE SPECIALLY CONSTRUCTED FOR EXPORT, AS NO SKILLED LABOUR IS REQUIRED FOR REPAIRS.

SAMPLES OF WORK SENT POST FREE ON APPLICATION.

A MONTH'S TRIAL ALLOWED TO ANY PERSON REQUIRING A MILL.

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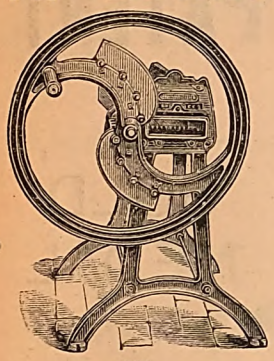
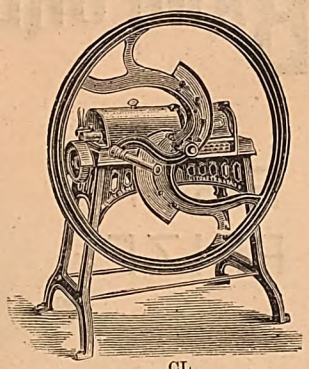
H. BAMFORD & SONS, UTTOXETER.

FIRST PRIZE PATENT CHAFF CUTTERS.



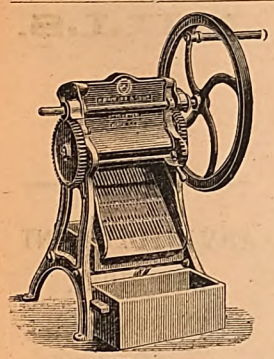
CC2.

		£	s.	d.
CC2, with 8in. Mouthpiece	Price	2	5	0
CX, with 8¾in. rising Mouth	,,	2	12	6
GCX, with patent lever for altering length	,,	2	17	6
Extra large Fly-wheel, 2s. 6d. extra	Treadle, 7s. 6d. extra.			
CL, with 9½in. rising mouth, cuts 2 lengths	Price	4	0	0
CLF, as above, with extra large wheel	,,	4	5	0
DL, with rising mouth and two handles	,,	5	15	0
DL, with stop and reverse motion	,,	6	12	6
RL, with 10½in. rising mouth and 2 handles	,,	8	15	0
XL, with 11in. rising mouth and 2 handles	,,	10	0	0



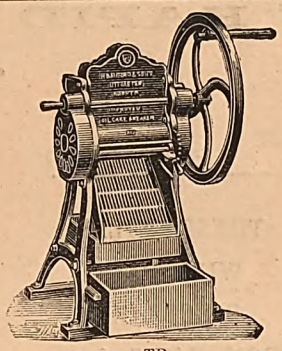
CL

PRIZE MEDAL OIL CAKE MILLS.



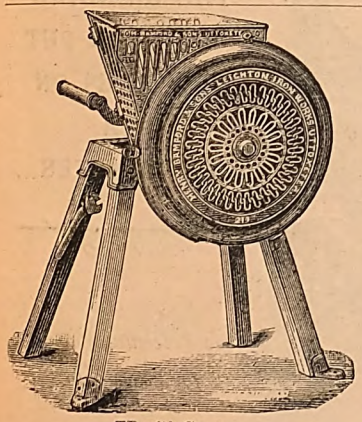
CE

		£	s.	d.
CA, 12½in. wide, with 2 boxes	Price	2	15	0
CE, 14in. ,, ,, ...	,,	3	0	0
CO, 16in. ,, ,, ...	,,	3	5	0
TE. 12½in. ,, with covered gearing	,,	3	3	0
TR, 14in. ,, ,, ...	,,	3	6	0
TA, 16in. ,, ,, ...	,,	3	12	6



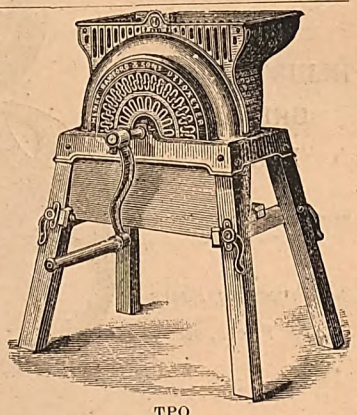
TR

IMPROVED DISC TURNIP CUTTERS.



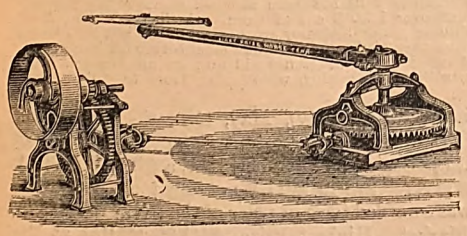
TP with Cover.

		£	s.	d.
TP Pulper without Cover	Price	2	7	6
TP ,, with Cover	,,	2	12	6
TPO ,, ,, 4 Knives	,,	3	6	0
TPO ,, ,, 6 ,, ...	,,	3	10	0
CP ,, ,, 6 ,, ...	,,	3	16	0
Slicers or Finger Cutters same prices.				
RCP Pulper and Slicer	Price	5	5	0
CPS ,, ,, ...	,,	6	6	0



TPO

FIRST PRIZE
IMPROVED HORSE & PONY GEARS.



	£	s.	d.
No. 3. Pony or Mule Gear, Self-contained, with two Speeds .. .. Price	7	7	0
No. 5. Ditto, with separate Motion and Pulley .. .. ,,	8	17	6
No. 4. Horse Gear, Self-contained, for One Horse .. .. ,,	11	10	0
No. 4. Ditto, for Two Horses .. .. ,,	12	10	0
No. 2. Ditto, with separate Motion and Pulley for One Horse .. .. .. ,,	12	0	0
No. 2. Ditto, for Two Horses .. .. ,,	13	0	0
No. 1. Ditto, with separate Motion and Pulley for Two Horses .. .. .. ,,	15	5	0
No. 1. Ditto, for Three Horses .. .. ,,	16	10	0

10 Prize Medals Awarded

NEW PATTERN

CHAIN PUMPS

Will lift any kind of thick liquid. Thousands in use, giving great satisfaction.
No Farmer should be without one

	£	s.	d.
2in. by 12ft. .. Price	3	10	0
2½in. by 12ft. .. ,,	3	15	0
3in. by 12ft. .. ,,	4	0	0

Also Makers of the "Royal" Mowers and Reapers, "Lion" Horse Rakes, "Progress" Haymakers, &c., &c., for which they have been awarded OVER 100 GOLD AND SILVER MEDALS, AND OTHER PRIZES. FOR PRICES AND PARTICULARS SEE GENERAL CATALOGUE.

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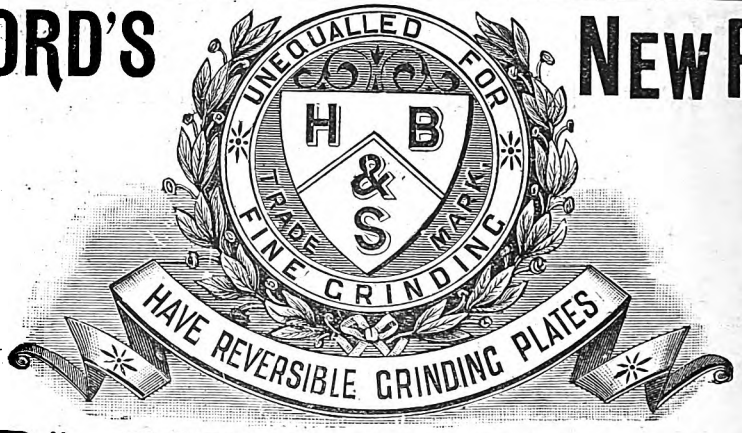
BAMFORD'S NEW PATENT

FIRST PRIZE

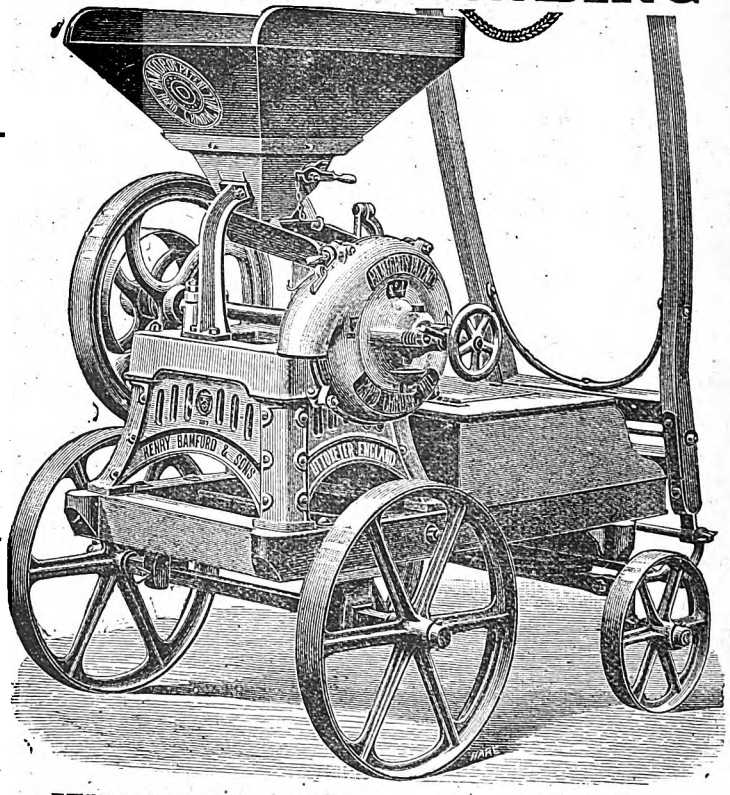


GOLD MEDAL

"RAPID" CORN GRINDING MILLS.

THESE MILLS WILL PASS PIECES OF IRON, NAILS, &c., WITHOUT INJURY TO THE GRINDING PLATES.

See Preceding Pages for Prices, etc.



ANY INTELLIGENT LABOURER CAN REVERSE THE GRINDING PLATES OR PUT NEW ONES ON IN A FEW MINUTES.

See Preceding Pages for Prices, etc.

EXTRACTS FROM UNSOLICITED TESTIMONIALS.

From W. A. WATSON-ARMSTRONG, ESQ., Cragside, Rothbury, January 7th, 1890.

The "Rapid" Grinding Mill you supplied for Lord Armstrong, at Netherton, is a great success.

From MESSRS. B. BRETT AND SON, Homerton Granary and Steam Mills, London, N.E.

We have used other Grinding Mills, but believe this is the best Mill in the market.

From MR. JOHN G. EAGLES, Ranelagh Cake Mills, Leamington.

I have given the No. 4 Mill a severe trial, as I did not intend to keep it unless I found a decided improvement on those Metal Grist Mills of various makers I am now running. It has done exceedingly well and makes first class work, taking little power. This Mill is in continuous work from Monday till Saturday every week.

From MESSRS. W. VERNON AND SONS, Fole Mills.

Your "Rapid" Grinding Mill has been at work continuously day and night, and has ground over 1,000 Sacks of Corn, principally Indian Meal, with one pair of grinding plates, and they are not yet worn out; it is our opinion they will grind over 2,000 sacks of Indian meal before being renewed.

NOTE.—A pair of full-sized millers' stones will not, on an average, grind more than 100 bags without redressing, which costs from 5s. to 10s. each time.

LATEST HONOURS!! At the Great Exhibition of Machinery held at Wittstock (Germany), May, 1890, the First Prize, **A LARGE SILVER MEDAL,** was awarded to the "RAPID" GRINDING MILL. At the important Competitive Trials of GRINDING MILLS, open to all England, held at Derby by the Derbyshire Agricultural Society, September, 1888, a **SILVER MEDAL** was offered for the best "GRINDING MILL FOR FARMERS' USE." The **PATENT "RAPID MILL"** not only took the FIRST PRIZE but ground so rapidly and made such excellent work that a **GOLD MEDAL** was awarded to it in place of the SILVER ONE, thus clearly showing that it is the best CORN GRINDING MILL now in the Market. Highest Prize—**SILVER MEDAL** at the Newcastle Show, August, 1890. Highest Award—Royal Manchester, Liverpool and North Lancashire Show at Crewe, July, 1890.

Full Descriptive Catalogue, with Testimonials and Samples of Work, sent Post Free on application to the authorized Agents in every District, or to

THE PATENTEES AND MANUFACTURERS,

HENRY BAMFORD SONS, Leighton Iron Works, Uttoxeter, Staffs.

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AT ABOUT THE
SAME PRICE.

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Blakey's

WHY THEN
ATTEMPT TO
SELL
Imitations
WHICH GIVE
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To Customers
and
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the Sale of the
Genuine
Article.

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TO SELL
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OF
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Does it Pay
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VICTIMISE
YOUR
FRIENDS
BY
Sending Frauds
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Blakey's
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WILL SAY
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IT DOES
NOT PAY.

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BEWARE OF RUBBISHY AND MISCHIEVOUS IMITATIONS.

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JOHN BLAKEY, LEEDS, ENGLAND.

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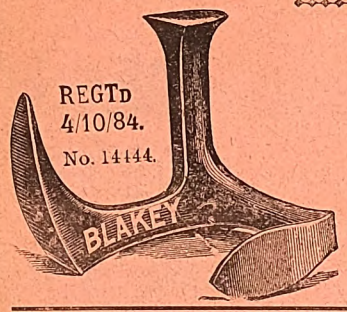
BLAKEY'S SPECIALTIES.



Blakey's Registered 'Paragon Last'

DEFIES ALL COMPETITION.

And is admitted to be the best in the market. One Last takes the place of a full set (no stand required). All sizes of Boots may be repaired or "Protected" by its use.

Prices: **No. 1, 12/-** per doz.; **No. 2** (a little larger), **15/-** per doz.

Blakey's Patent Self-Fixing Cricket Spike.

IN TWO SIZES.

No. 2.

These Spikes are now used in preference to all others; they are easily fixed, and give that firm grip which is so necessary when great muscular exertion is exercised.

No. 1, (12 to the set & fixed on Cards), 30s. per grs.
No. 2, (8 to the set & fixed on Cards), 30s. per grs.

Send for Terms.

BLAKEY'S PATENT 'KICKER' TOE TIP

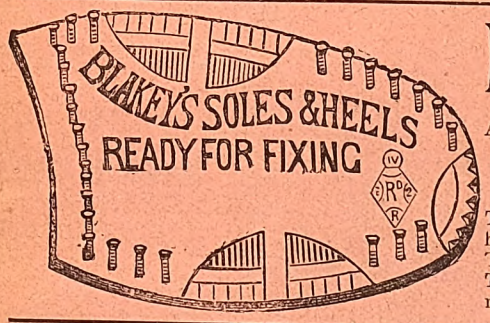
For saving the Toes of Children's Boots. Can be affixed with ease to New or old Boots. Simple, effective and cheap.

Price 8/- per Gross Pairs (including Rivets for Fixing).

By having a stock a Shopman can serve a customer with Boots *tipped* or *untipped*.

SEND FOR TERMS.

PATENT. No 2718. A.D. 1884.



Blakey's Leather Soles and Heels.

All sizes shaped to suit all kinds of Boots. Labour saved and waste avoided by having a selection of these Soles and Heels.

PRICE 1/6 PER LB.

The advantages in purchasing Cut Soles are, NO WASTE or OFFAL is left on your hands; you know the exact profit made on each pair sold; you have no labour in cutting. Thus one Shopman is enabled to do the work of at least four. NO WASTE! NO TROUBLE!! Every Sole and Heel bears a number, and by referring to the list the most inexperienced person can serve customers.

BLAKEY'S PATENT STEP PROTECTORS.

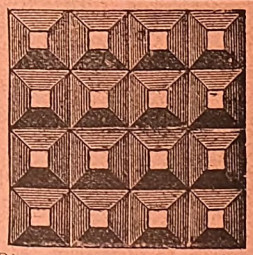


Diagram shewing one of eleven sizes.

BLAKEY'S STEP PROTECTORS are made in sections of various lengths. No screws or nails required. Almost any design can be adopted. Names can be formed with them if necessary upon every step. Any carpenter can fix them. They protect the step from wear, at the same time ensure safety, and any section can easily be replaced at small cost.

STRAWSON'S CELEBRATED WATERPROOF.

Proprietor, John Blakey, Leeds.

30 YEARS' UNINTERRUPTED PUBLIC APPROVAL.

Testimonials from the leading men of the day. It renders all kinds of Leather THOROUGHLY WATERPROOF. Boots dressed with it are not affected by snow, dew, fresh or salt water.

(In Tins.)

3d.	6d.	1s.	2s.	5s. & 10s.	*Gr.* 24s.	*Gr.* 48s.	*Gr.* 96s.	*Doz.* 16s.	*Doz.* 40s.	*Doz.* 80s.

Send for full Price List and Terms to **JOHN BLAKEY, LEEDS, ENGLAND.**

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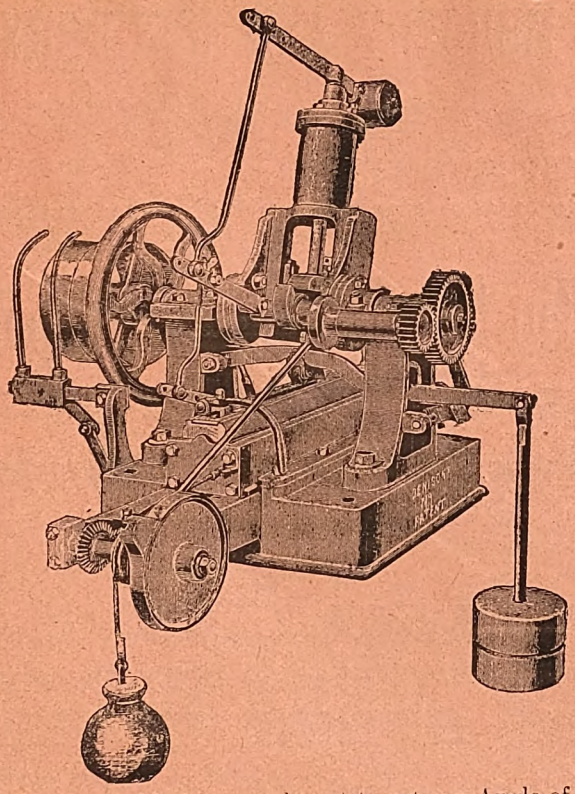
LEEDS,

ENGLAND.

By the aid of this Machine, Files can be cut equal to the best hand labour at about $\frac{1}{5}$ the cost.

PATENTED IN ENGLAND AND ABROAD.



Will cut
Bastard, Second-cut, and Smooth Files,
from 3 inches to 24 inches
any shape.

Will cut
Flat Files, Hand Files,
Half-round, Round,
Square, and Three-Square Files,
Saw Files, Mill Saw Files,
Reaper Files,
any shape,
Cotter Files, Rail Files,
&c., &c., &c.
Equal to Hand-Cut.

The Head of this Machine can be set to cut any Angle of Tooth.

Every Shopkeeper in the World should use

THE STANDARD

CASH REGISTER.

Firth's Patent.

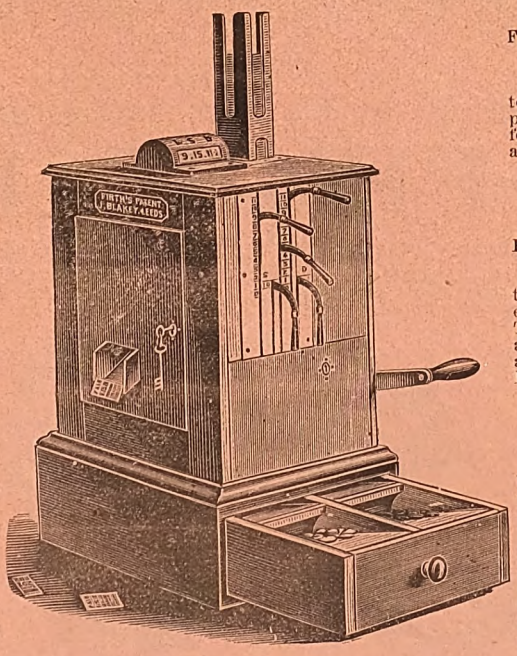
A PERFECT CHECK.

In these days of keen competition, nothing can be more necessary than looking after the Cash, and good Book-keeping.

This Machine accomplishes these two objects with perfection.

By its aid you are acquainted every evening with the exact amount of cash taken during the day, each separate sale being duly printed on a paper tape, which when taken from the Machine and added up, will represent the exact amount received.

It also provides a ticket with the amount of each purchase printed on the front, to be presented to the customer; the back may be used for advertising purposes.



TESTIMONIALS.

From J. A. Bradburn, Ironmonger, 85, Princess Street, Manchester, Dec. 21st, 1889.

"Dear Sir,—I have much pleasure in giving testimony to the value of the Cash Register supplied by you. I have had the Machine in work for some months, and find it a saving of time and money in many ways.

Yours faithfully,
J. A. BRADBURN."

From Jas. Russel, Easter Road, Leith, and Albert Place, Edinbro', April 9th, 1890.

"Dear Sir,—I have now had a two months' trial of Firth's Patent Cash Register. It is an excellent Machine, and the only real Check Till that I have seen. It does its work quickly and correctly. Be good enough to forward me another at your earliest convenience, for my Easter Road Establishment.

And oblige, faithfully yours,
JAMES RUSSELL."

From Edward G. Fulcher, Tea and Coffee Dealer, 128, Kentish Town Road, N.W., London, May 19th, 1890.

"Sir,—Please let me have, as early as you can, 10,000 tickets for Register, as enclosed. I am pleased to say the Machine is giving every satisfaction, and I consider it the most perfect Check Till and Register I have seen during my thirty-six years' experience as a grocer, and have much pleasure in recommending it. Yours truly,
EDWARD G. FULCHER."

Send for Price Lists and Drawings, to

JOHN BLAKEY, LADY LANE, LEEDS.

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JOHN BLAKEY, Leeds,

BOOT AND SHOE MERCERY AND GRINDERY MANUFACTURER,

ALSO

Manufacturer of Boot and Shoe Machinery.

ALL THE LATEST IMPROVEMENTS. *Send for List, issued 1st of each Month.*

SPECIALTIES:

LACES, Kip Spanish Horse, Porpoise, and Mohair.

HEEL BALLS. BUTTONS & FASTENERS.

Wholesale Shoe Mercery & Grindery Merchant.

Brass and Iron Rivets. Steel Bills. Cut and Wrought Malleable Hobs. Heel and Toe Tips and Plates. Iron Block Lasts. Socks and Slippers. Boot and Shoe Machinery and Sole and Heel Knives, new and second-hand. Threads and Hemp—all Makes.

BLAKEY'S LACE CUTTING MACHINE, For cutting Leather Laces out of Waste Leather, No Manufacturer should be without them. Price 50s.

MIKADO SOCKS AND SLIPPERS.

LARGEST STOCK IN ENGLAND.

Special attention is given to export Orders. Send for Catalogue issued Monthly.

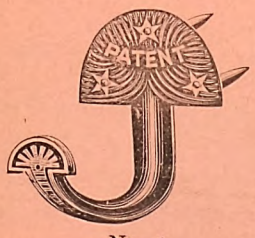
BLAKEY'S PATENT UNIVERSAL HOOK.

No. 2946—1886.

No Article can be more useful than these

SELF-FIXING HOOKS.

They answer admirably for the hanging of all kinds of Merchandise, including: Boots, Clothes, Crockery, Pictures, &c. They are invaluable for household purposes, for Shops, Warehouses, Offices, &c. No Nails or Screws being required, they fit easily into Walls, Partitions, Plaster, or any kind of Wood.



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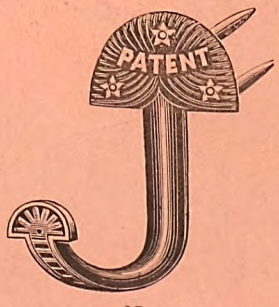
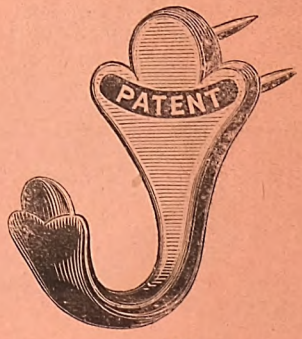
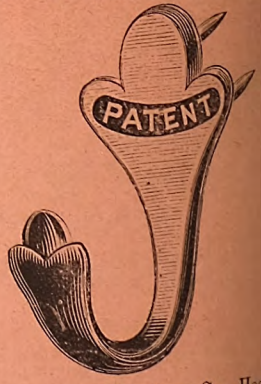
No. 1, **30/0.**



No. 2, **3/0,**
No. 2, **36/0.**



No. 3, **4/6,**
No. 3, **54/0.**



No. 4. ℔ Grs. Hooks **5/0** loose in Boxes.
No. 4, ℔ Grs. Cards, **60/0.** 1 doz. Hooks on each card.

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HILL & SMITH,

MANUFACTURERS OF EVERY DESCRIPTION OF

Galvanized Iron,

CORRUGATED & FLAT SHEETS,

GUTTERS and RIDGE CAPS,

TANKS & CYLINDERS,

Buckets & Hollow-ware

AND

GALVANIZED WIRE NETTING.

Tividale Galvanizing Works,

TIPTON,

SOUTH STAFFORDSHIRE.

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HILL & SMITH,

MANUFACTURERS OF

THE PATENT

SELF-ADJUSTING SHEETS.

CORRUGATED PATTERN.

Section showing Joint.

These sheets possess immense advantages over the ordinary Galvanized Corrugated Sheets. THEY CAN BE FIXED IN ONE-SIXTH THE TIME, and do not require one-fourth the quantity of fittings, as the side laps require no screws or bolts and nuts. They also make an absolutely WIND AND WATER-TIGHT JOINT, and the bead imparts greater rigidity to the roof, thus enabling a lighter sheet to be used. As will be seen from the diagrams, in order to fix the sheets, it is only necessary to slide the side beads into one another. This makes a perfect joint without fittings, and the sheets also slip easily into each other at the ends, and need only to be secured by a couple of screws through the crosslaps to purlines.

TIVIDALE GALVANIZING WORKS,

TIPTON,

SOUTH STAFFORDSHIRE.

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HILL & SMITH,

MANUFACTURERS OF

THE PATENT

SELF-ADJUSTING SHEETS.

TILE PATTERN.

Section showing Joint.

The Patent Tiles weigh 10% less than the Patent Corrugated Sheets for equal covering space, thus

	Cwt.	qrs.	lbs.
1 Square of 100ft. Super and 24 G. Corrugated, weighs	1	1	14
1 Ditto ditto Tiles ditto	1	1	0

A very great saving can consequently be effected where the Patent Tiles are used.

PRICES.

Corrugated or Tile Pattern	24 G.	26 G.	28 G.
Up to 8 ft. long	£15	£16 10s.	£17 10s. per Ton.

Delivered free on board Liverpool in ¼ ton Skeleton Cases.

TIVIDALE GALVANIZING WORKS,

TIPTON,

SOUTH STAFFORDSHIRE.

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HILL & SMITH,

MANUFACTURERS OF

The "Corrugated" Bucket.

REGISTERED DESIGN No. 47499.

This Bucket is designed to combine a maximum of strength with a minimum of weight. The swaging of the sides, as shewn in the illustration, renders the Bucket as strong and durable as if made from double the thickness of material.

	PRICES.				
	10	11	12	13	14 inches.
No. A, 12in. × 9 in. deep × 33lbs.	6/-	6/9	7/9	8/9	10/- per dozen.
No. B, 12in. × 9½in. deep × 36lbs.	6/3	7/-	8/-	9/-	10/3 „
No. C, 12in. × 10¼in. deep × 40lbs.	7/-	7/9	8/9	9/9	11/- „

Delivered to any Station in England in lots of £2 and upwards.

Tividale Galvanizing Works,

TIPTON,

SOUTH STAFFORDSHIRE.

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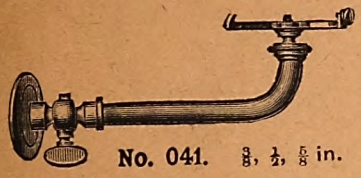

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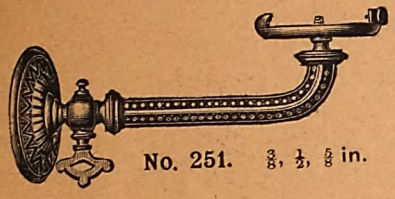

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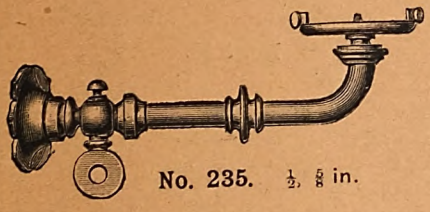

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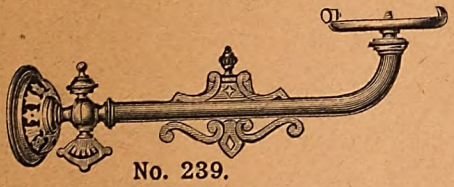

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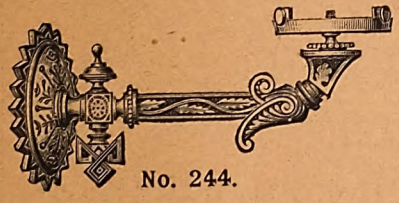

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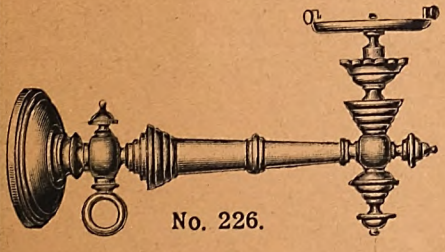

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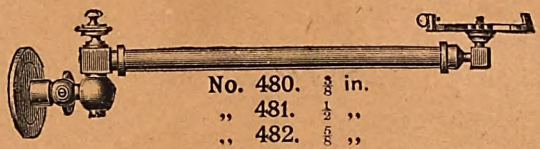

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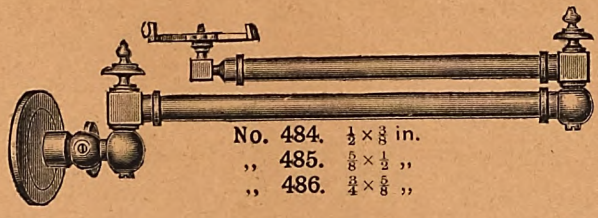

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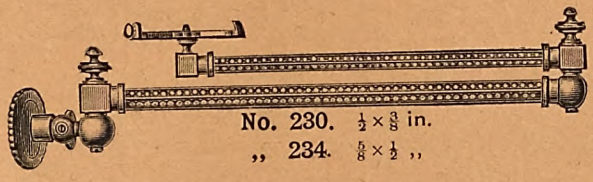
,, 485. $\frac{5}{8} \times \frac{1}{2}$,,
,, 486. $\frac{3}{4} \times \frac{5}{8}$,,



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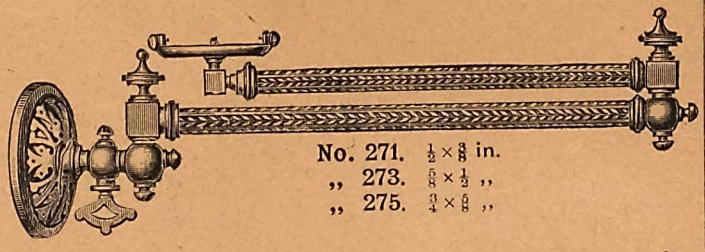

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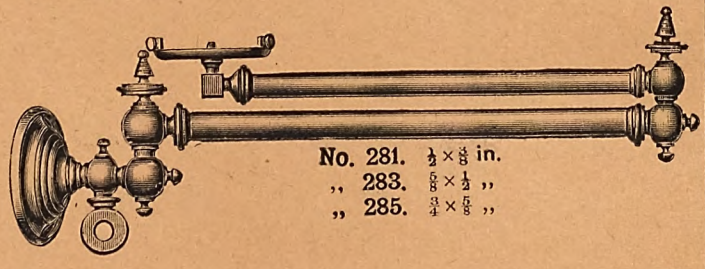

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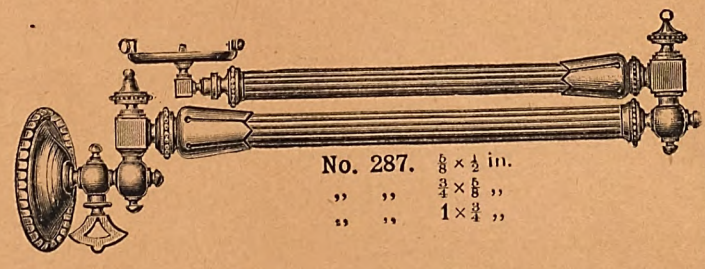

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,, ,, $\frac{3}{4} \times \frac{5}{8}$,,
,, ,, $1 \times \frac{3}{4}$,,

CHAS. JOYNER & Co., BIRMINGHAM,

Manufacturers of Gas Fittings.

PRICE LISTS ON APPLICATION.

London Office & Show Rooms: COLONIAL BUILDINGS, HATTON GARDEN.

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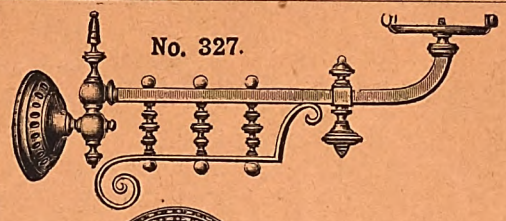
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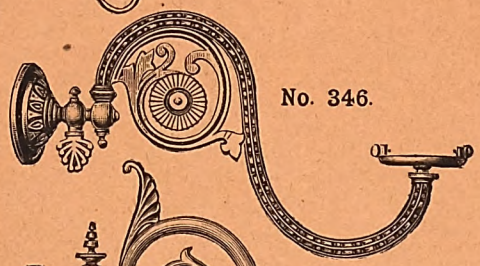
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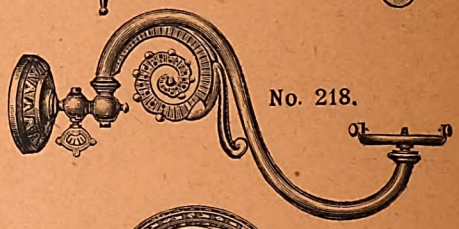
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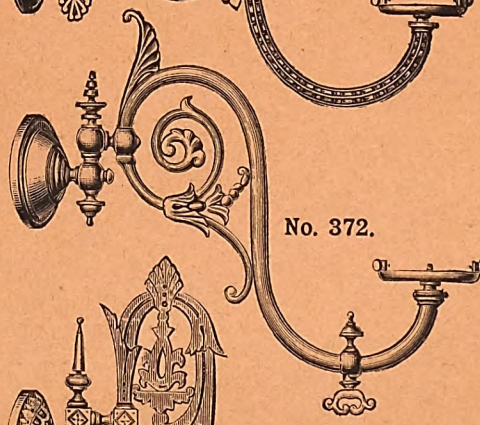
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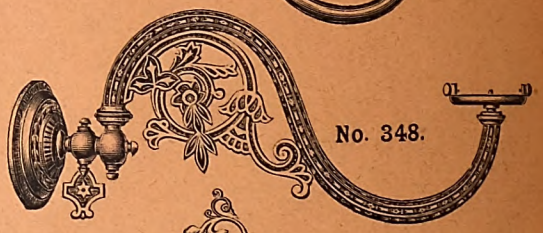
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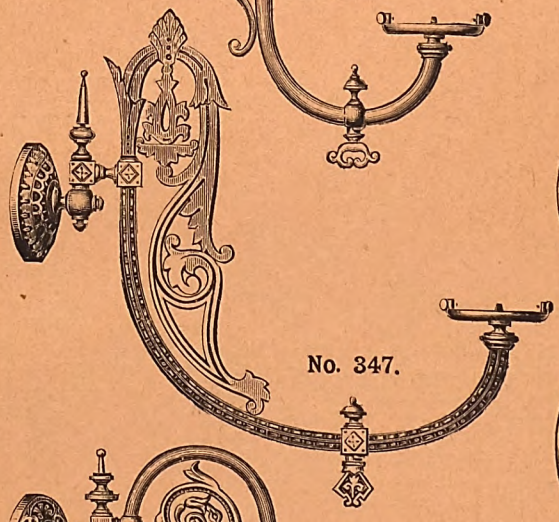
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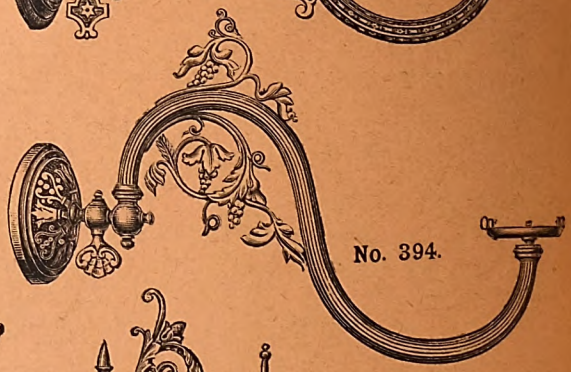
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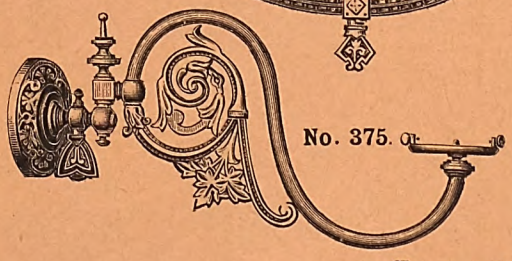
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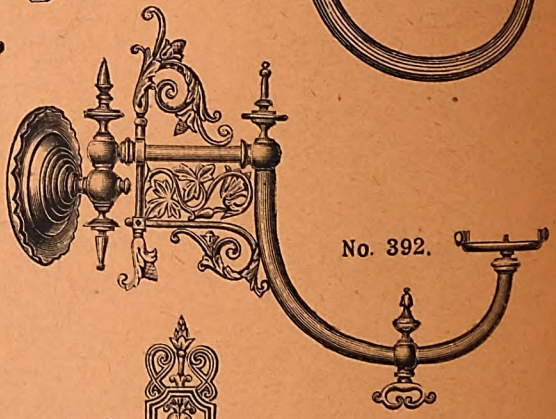
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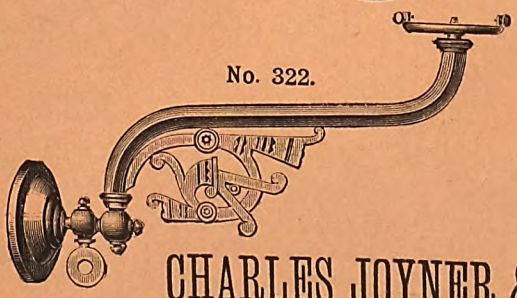
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No. 374.

CHARLES JOYNER & CO., BIRMINGHAM.

Manufacturers of Scroll Brackets, Polished and Bronzed.

FIRST CLASS AWARD, MELBOURNE EXHIBITION, 1888.

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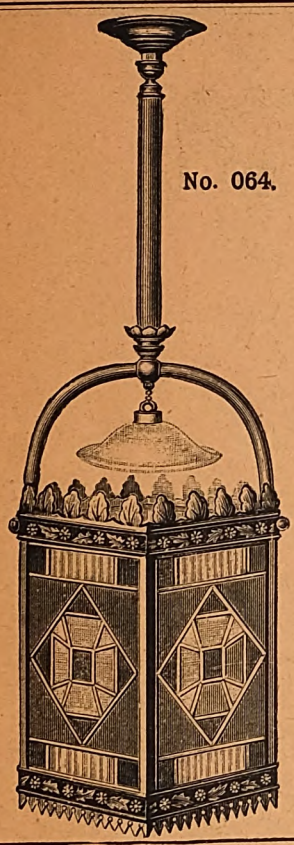

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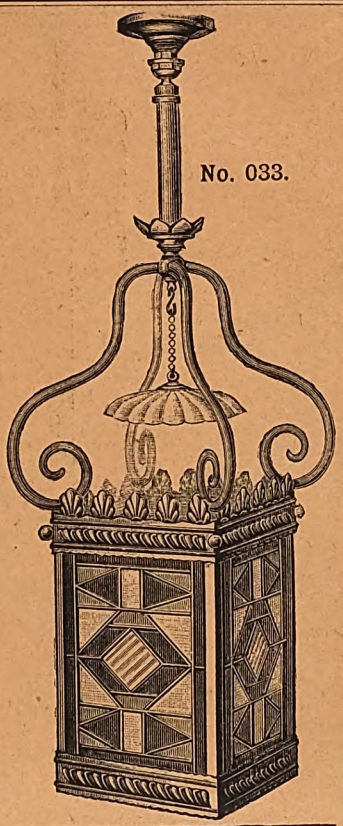

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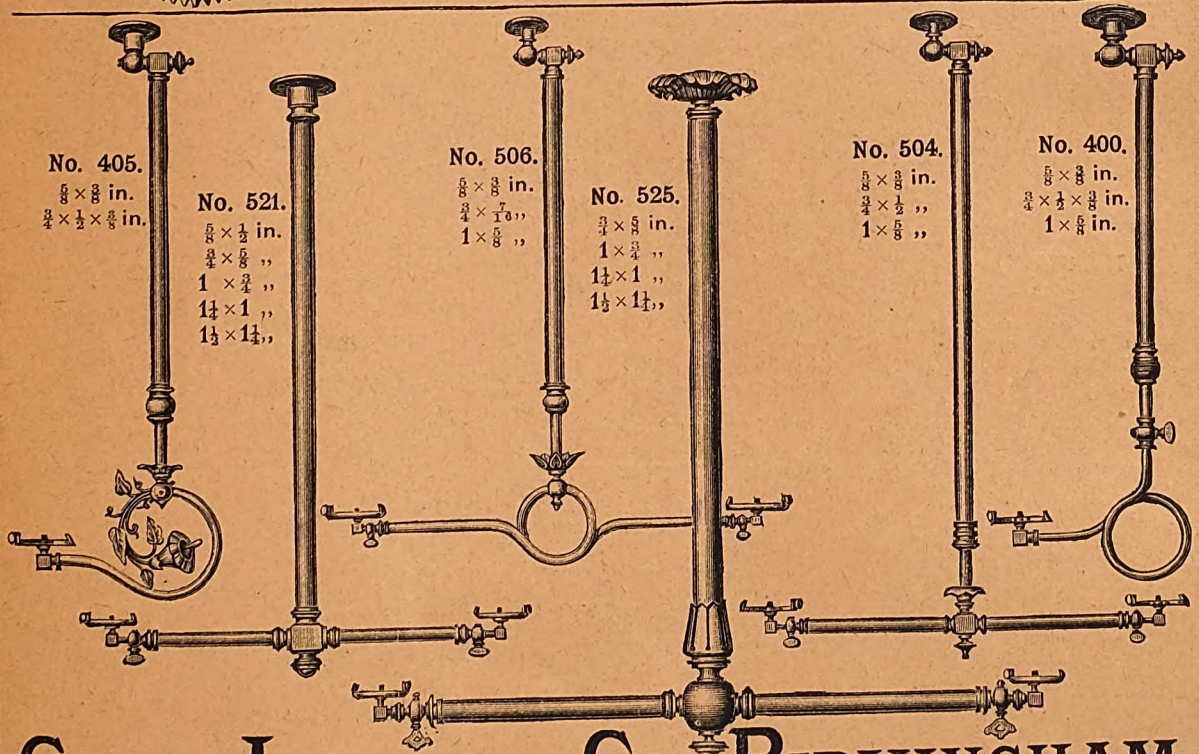

No. 405.
$\frac{5}{8} \times \frac{3}{8}$ in.
$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{8}$ in.

No. 521.
$\frac{5}{8} \times \frac{1}{2}$ in.
$\frac{3}{4} \times \frac{5}{8}$,,
$1 \times \frac{3}{4}$,,
$1\frac{1}{4} \times 1$,,
$1\frac{1}{2} \times 1\frac{1}{4}$,,

No. 506.
$\frac{5}{8} \times \frac{3}{8}$ in.
$\frac{3}{4} \times \frac{7}{16}$,,
$1 \times \frac{5}{8}$,,

No. 525.
$\frac{3}{4} \times \frac{5}{8}$ in.
$1 \times \frac{3}{4}$,,
$1\frac{1}{4} \times 1$,,
$1\frac{1}{2} \times 1\frac{1}{4}$,,

No. 504.
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$\frac{3}{4} \times \frac{1}{2}$,,
$1 \times \frac{5}{8}$,,

No. 400.
$\frac{5}{8} \times \frac{3}{8}$ in.
$\frac{3}{4} \times \frac{1}{2} \times \frac{3}{8}$ in.
$1 \times \frac{5}{8}$ in.

CHAS. JOYNER & Co., BIRMINGHAM.

MANUFACTURERS OF

Hall Lanterns. Stiff and Sliding Pendants, &c., &c.

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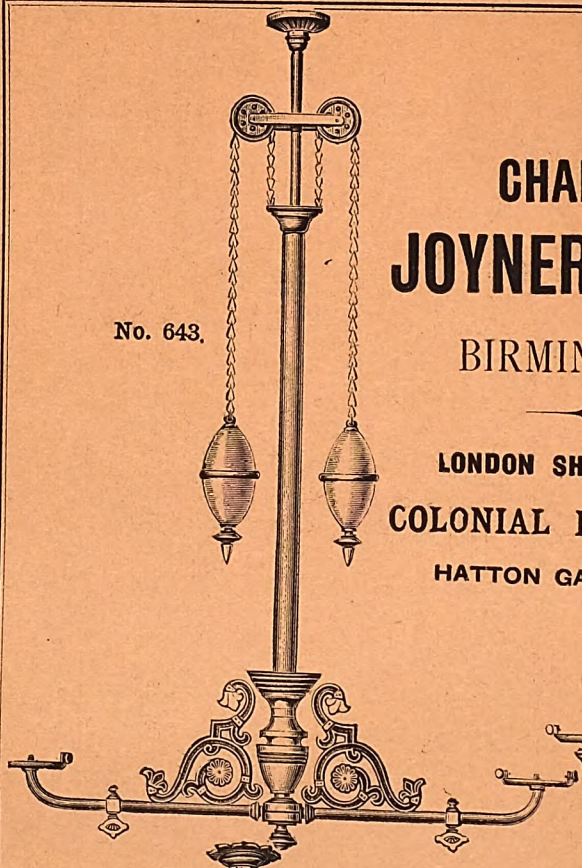
CHARLES JOYNER & CO.,

BIRMINGHAM.

LONDON SHOW ROOM:
COLONIAL BUILDINGS,
HATTON GARDEN, E.C.



No. 643.

No. 681.

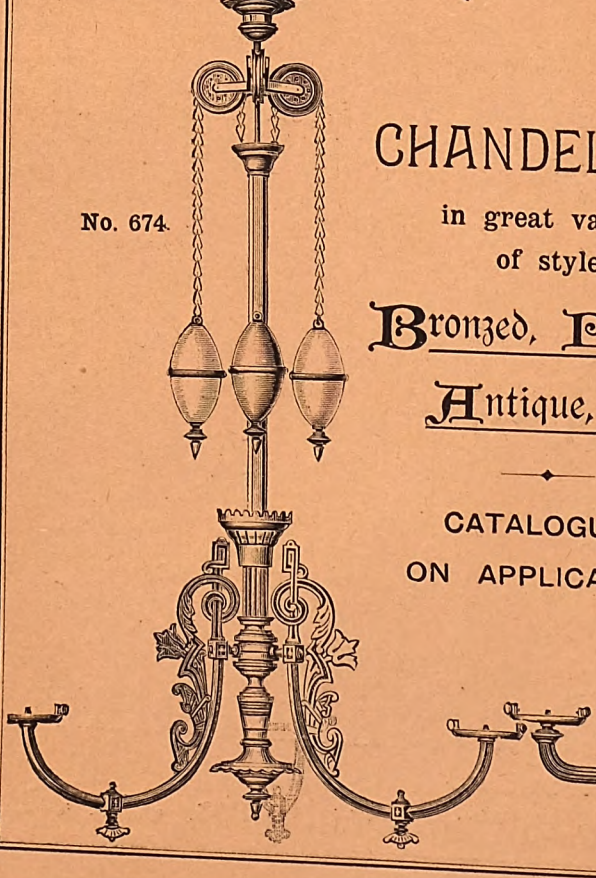
CHANDELIERS

in great variety
of style,

Bronzed, Polished,

Antique, &c.

CATALOGUES
ON APPLICATION.



No. 674.

No. 682.

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Telegraphic Address:—"*ALBION*," *Rugeley.* *Trade Mark.*—"*BRITISH.*"

Woodroffe & Co., ALBION IRON WORKS,

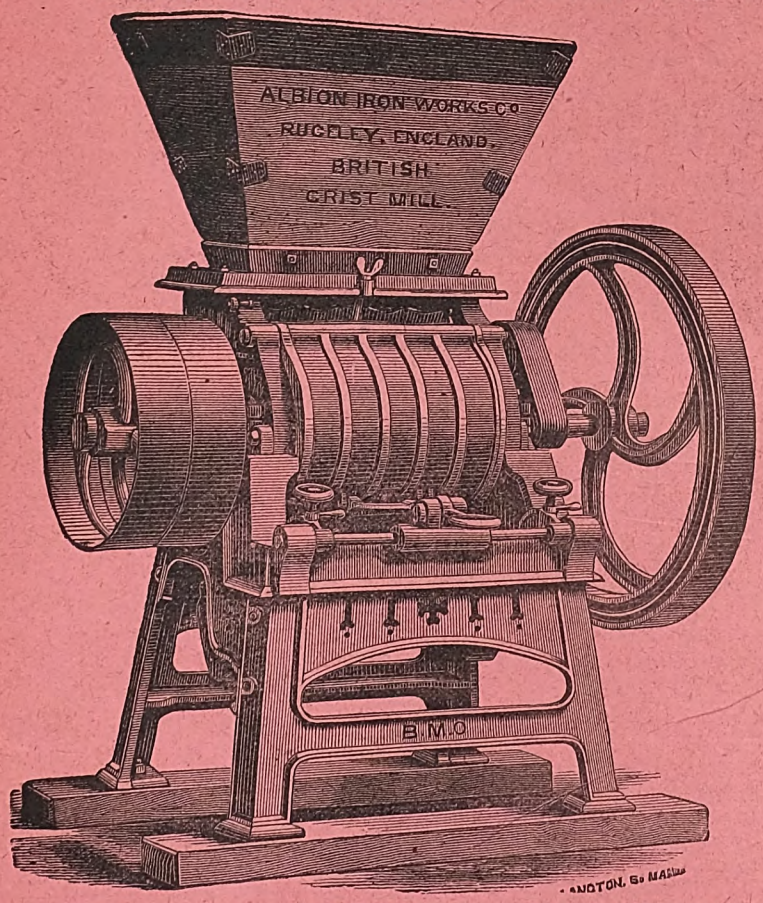
RUGELEY, STAFFORDSHIRE, England.

The Royal Prize Patent

"BRITISH" GRIST MILLS

With Reversible Grinding Barrel.

This Mill is fitted with a Safety Lever which allows Nails, Stones, or other hard substances to pass through without injury to the grinding surfaces.



The Grinding Barrel is very lasting, but when worn can be easily reversed and the plate renewed at a small cost. Guaranteed to do more work with less power than any other Metallic Mill.

THE **'BRITISH' GRIST MILL** was awarded the **FIRST PRIZE** at the **LATEST TRIALS** of the Highland & Agricultural Society of Scotland at Dundee, July, 1890; also the Royal Agricultural Society of England's **£10 PRIZE** at Plymouth, June, 1890. They have been successful in every trial, always shewing their superiority, thus proving the **'BRITISH'** to be the most simple, durable, and effective mill in the market.

SIZES AND PRICES.

Mill Marked	Power Required.	Will Grind per hour.	Will Crush per hour.	£	s.	d.	Mill Marked	Power Required.	Will Grind per hour.	Will Crush per hour.	£	s.	d.
BA	1 H-P	5 Bushels	12 Bushels	11	0	0	BMA	3 H-P	14 Bushels	36 Bushels	15	15	0
BM	2 ,,	7 ,,	16 ,,	13	0	0	BME	4 ,,	35 ,,	80 ,,	21	0	0
BMP	2½ ,,	10 ,,	28 ,,	14	0	0	BMO	6 ,,	45 ,,	120 ,,	29	0	0

ALL PULLEYS EXTRA ACCORDING TO SIZE.

THESE MILLS WILL GRIND OR CRUSH ANY KIND OF GRAIN TO ANY DESIRED SAMPLE.

SAMPLES OF WORK DONE AND TESTIMONIALS SENT ON APPLICATION.

The 'BRITISH' GRIST MILLS are particularly adapted for exportation.

GOOD TRADE DISCOUNT. SPECIAL QUOTATION TO SHIPPERS.

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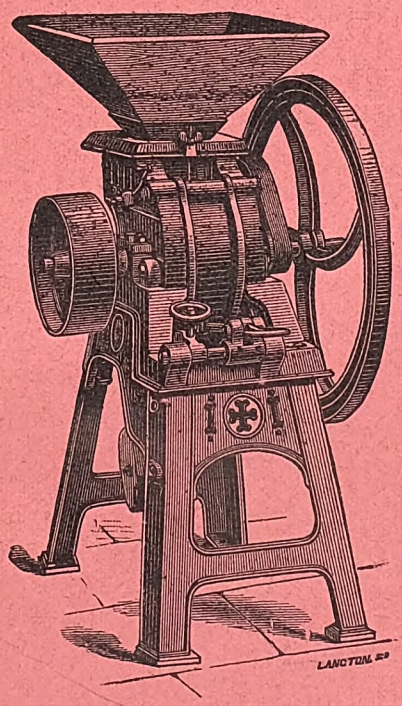
WOODROFFE & CO., ALBION IRON WORKS, RUGELEY.

Great Success of the "BRITISH"

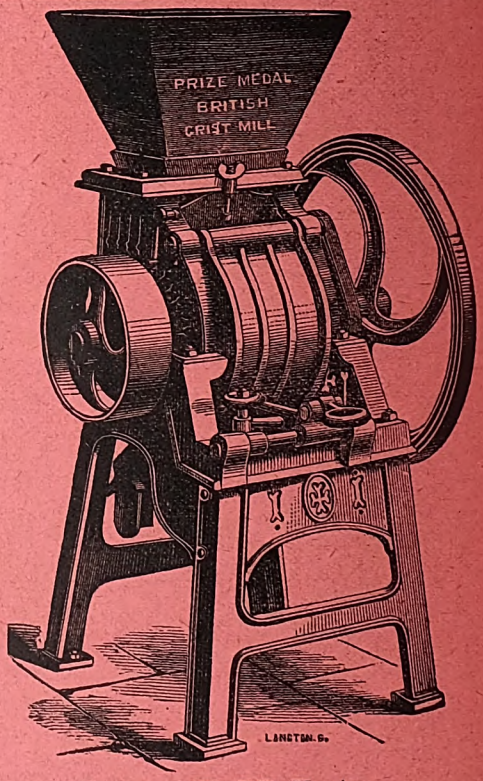
GRINDING & CRUSHING MILLS,

AWARDED THE FIRST PRIZE AT

LATEST TRIALS in **ACTUAL COMPETITION** with the Leading Makers



Illustrates **BA** size.



Illustrates **BMA** size.

THESE well-known Mills will grind or crush Wheat, Maize, Oats, Barley, Peas, Beans, Linseed, &c., to any desired sample. When grinding they produce a fine, soft, and cool meal. The power required for the amount of work done is much less than with stones or any other metallic mill. An important advantage exists not only in the great durability of the barrel and plate, but they require no recutting, the grinding surfaces being speedily re-sharpened by running a little fine sand or emery and oil through the mill, Special attention is directed to the Patent Safety Lever, which allows Nails, Stones, &c., to pass through the Mill without injury to the grinding surfaces. The Grinding Barrel is very lasting, but when worn can be reversed and the plate renewed at a small cost. The required working speed is only **300** revolutions per minute which is considerably less than that necessary to drive any other metallic Mill.

SIZES AND PRICES.

Mill Marked	Power required.	Will Grind per hour	Will Crush per hour	£	s.	d.	Mill Marked	Power required	Will Grind per hour	Will Crush per hour	£	s.	d.
JBX	Hand	3 Bushels	6 Bushels	5	5	0	BM	2 H-P.	7 Bushels	16 Bushels	13	0	0
JEX	½ H-P	5 ,,	10 ,,	7	10	0	BMP	2½ H-P	10 ,,	28 ,,	14	0	0
BA	1 H-P	5 ,,	12 ,,	11	0	0	BMA	3 H-P	14 ,,	36 ,,	15	15	0

ALL PULLEYS EXTRA ACCORDING TO SIZE.

SAMPLES OF WORK DONE AND TESTIMONIALS SENT POST FREE ON APPLICATION.

THESE MILLS WILL GRIND OR CRUSH SOFT OR BADLY HARVESTED GRAIN.

SPECIALLY DESIGNED TO PACK IN SMALL COMPASS FOR EXPORT.

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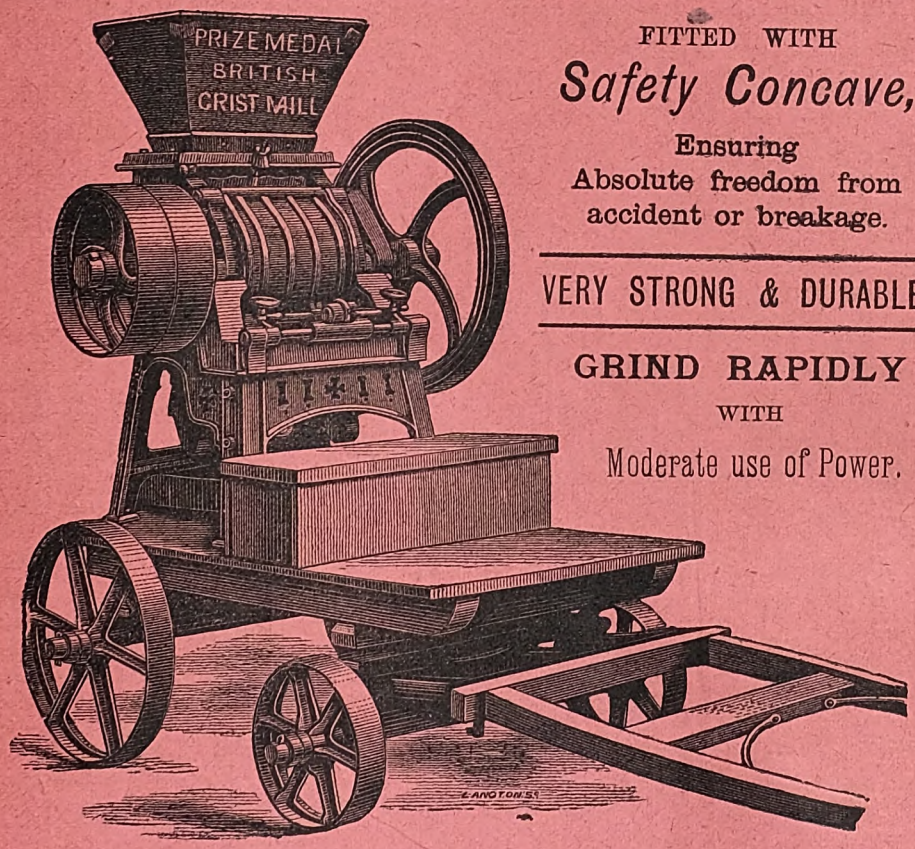
WOODROFFE & CO., ALBION IRON WORKS, RUGELEY.

The ROYAL PRIZE at Latest Trials.

'BRITISH' PORTABLE GRIST MILLS.



FITTED WITH

Safety Concave,

Ensuring
Absolute freedom from
accident or breakage.

VERY STRONG & DURABLE.

GRIND RAPIDLY
WITH
Moderate use of Power.

ANOTHER SUCCESS at the **LATEST** Exhaustive Trials of Grinding Mills, extending over three days, held at Dundee, July, 1890, by the Highland and Agricultural Society of Scotland, the **FIRST PRIZE OF £12** was awarded to the **"BRITISH" GRIST MILL.** The Royal Agricultural Society of England's **£10 PRIZE** was also obtained at Plymouth, June, 1890. At these the only real trials held of Mills for many years, **38** were entered for competition, manufactured by Messrs. Barford & Perkins; Henry Bamford & Sons; Nicholson & Sons, Ltd.; Blackstone & Co., Ltd.; E. R. & F. Turner; C. Burrell & Sons, Ltd.; J. Williams & Son; Agricultural Mill Co.; R. G. Morton; W. Balfour, &c., &c.

SIZES AND PRICES OF PORTABLE MILLS.

Mill Marked,	Power required,	Will Grind per hour,	Will Crush per hour,	With Two-wheel Carriage,	With Four-wheel Carriage,
BMA	3 H-P	14 Bushels	36 Bushels	£21 0 0	£23 12 6
BME	4 H-P	35 ,,	80 ,,	27 17 6	30 0 0
BMO	6 H-P	45 ,,	120 ,,	36 5 0	39 7 6

ALL PULLEYS EXTRA ACCORDING TO SIZE.

GOOD TRADE DISCOUNT. SPECIAL QUOTATION TO SHIPPERS.

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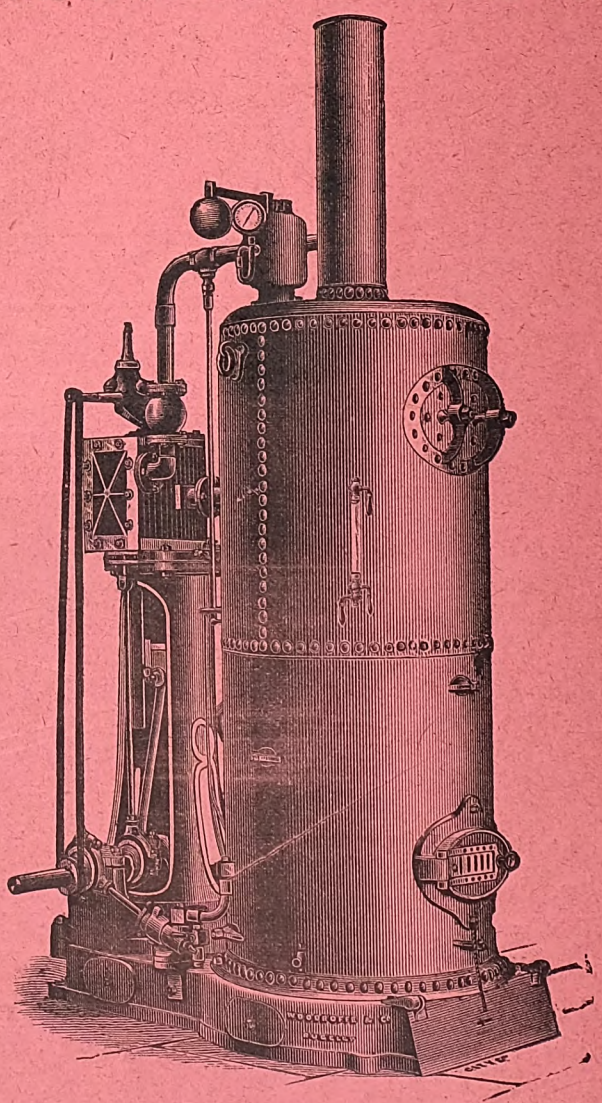
WOODROFFE & CO., ALBION IRON WORKS, RUGELEY.

"ALBION"

VERTICAL STEAM ENGINES.

WITH IMPROVED GOVERNOR AND VERTICAL CROSS-TUBE BOILER.

These celebrated Engines have been specially designed to supply the demand for a powerful, serviceable, and simple motor, at a moderate Price. They are substantially and carefully constructed, the best materials and workmanship being employed. They are well adapted for estate, farm, and dairy work; and as a thoroughly good Engine at a low price, they are unequalled.



Notice to intending purchasers. It is essentially necessary in comparing prices to compare at same time the sizes of cylinder and boiler per nominal horse power. It will be observed that these Engines and Boilers are, in this respect, considerably more powerful than many others in the market. They are specially suited for exportation, being economical in packing and freight, with few parts, all easy of access. Easily fixed and managed in countries where skilled labour is not obtainable

Nominal Horse Power.	3	4	5	6
Diameter of Cylinder .. .. .. ins.	$5\frac{3}{4}$	$6\frac{1}{4}$	7	$7\frac{3}{4}$
Length of stroke .. .. .. ,,	9	$10\frac{1}{2}$	$10\frac{1}{2}$	12
Revolutions per minute	200	180	160	160
Height of Boiler without Base	5ft. 9in.	6ft. 6in.	7ft. 0in.	7ft. 6in.
Diameter of Boiler	2ft. 6in.	2ft. 6in.	2ft. 8in.	3ft. 0in.
Diameter of Fly Wheel .. .. ins.	36	36	42	42
Engine and Boiler on Tank	**£60**	**£80**	**£92**	**£106**

New Illustrated Catalogue of the "British" Grist Mills, Steam Engines, and Agricultural Machinery with Trade Discounts sent post free by WOODROFFE & Co., ALBION IRON WORKS, RUGELEY, STAFFS., ENGLAND.

GOOD TRADE DISCOUNT. SPECIAL QUOTATION TO SHIPPERS.

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Telegraphic Address: "Trunks, Birmingham."

ROBERT FOSTER & CO.

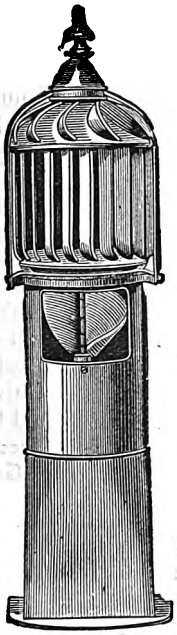
Telephone No. 589

40 to 52, MOSELEY STREET, BIRMINGHAM,

Manufacturers of Travelling Trunks, Bonnet Boxes, Baths, Wood & Iron Coal Vases, Safes,

AND ALL KINDS OF SHEET METAL WORK SUITABLE FOR HOME AND FOREIGN MARKETS.

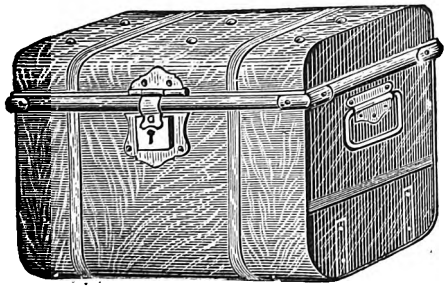
ARCHIMEDEAN CHIMNEY TOP.



CHEAP STAMPED TOP BONNET BOX.

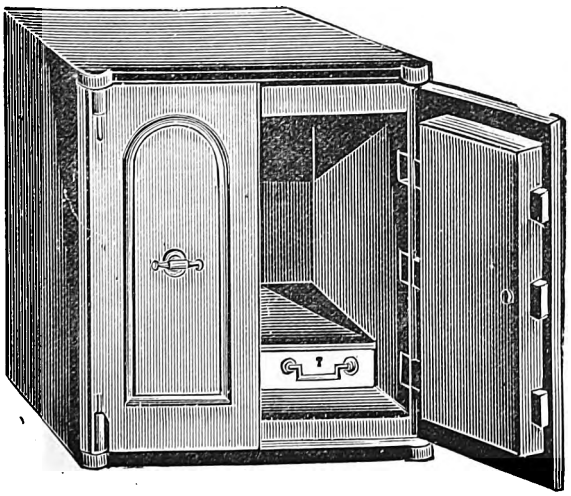
Archimedean Ventilator.

LEGAL NEST.



MOULDED SCARBORO'

THE LONDON



Consists of Four Superior Japanned Deed Boxes, with fall-down fronts and four compartments in each.

Size, 20 × 13 × 14 inches.

Mounted on an elegant Iron Stand with Brass Mountings.

Before Ordering please send for Illustrated Catalogue and Price Lists.

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Telegraphic Address: "Trunks, Birmingham."

ROBERT FOSTER & CO.

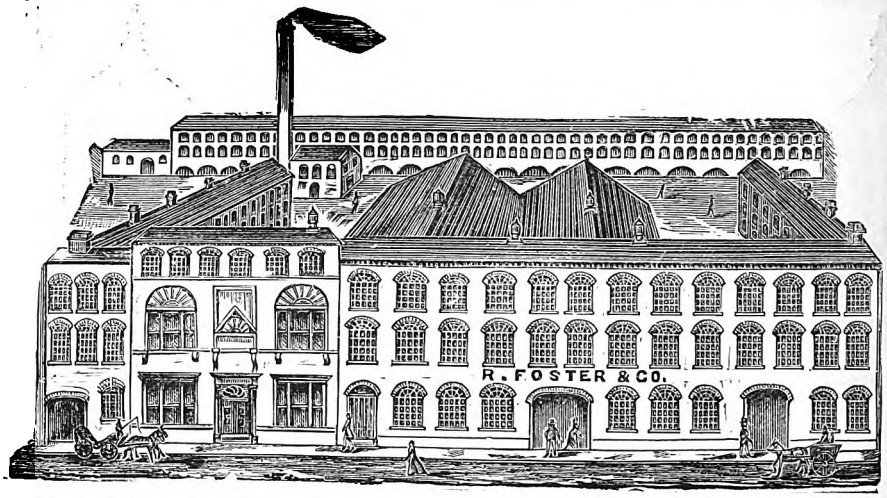
Telephone No. 589

40 to 52, MOSELEY STREET, BIRMINGHAM,

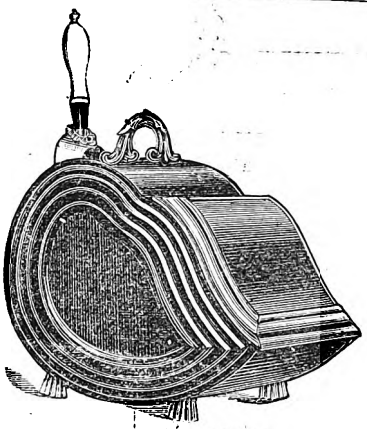
Manufacturers of Travelling Trunks, Bonnet Boxes, Baths, Wood and Iron Coal Vases, Safes,

AND ALL KINDS OF SHEET METAL WORK SUITABLE FOR HOME AND FOREIGN MARKETS.

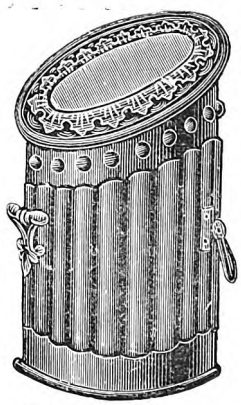
Tin, Zinc, and Iron Plate Workers, Braziers, Japanners, Galvanizers, &c.



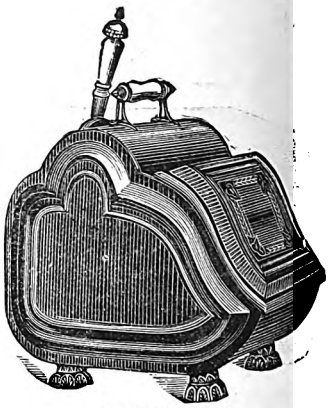
Manufacturers of the Improved Archimedean Ventilators, Chinn's Patent Automatic Ventilators, Trunks, Baths, Iron & Wood Coal Vases, Galvanized and General Sheet Metal Goods.



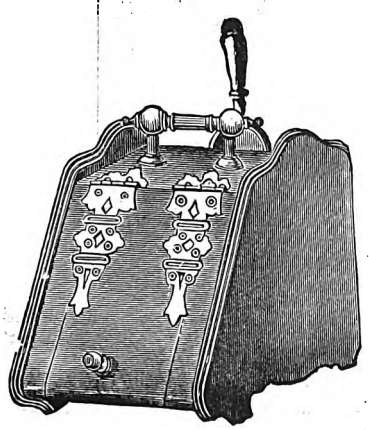
BALMORAL.



PURDONIAN.



RUSSELL.



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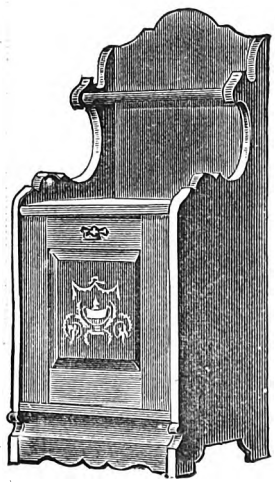

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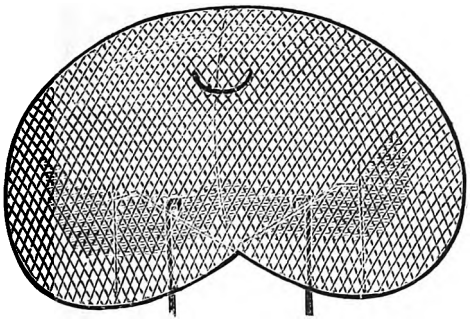
J. J. THOMAS & CO.

WHOLESALE MANUFACTURERS OF

Aviaries, Bird Cages, Fire Guards, Nursery Guards, Iron, Copper, and Brass Wirework, Sieves, Screens, and all kinds of Wire Goods, useful and ornamental.

360 & 362, EDGWARE ROAD, LONDON, W.

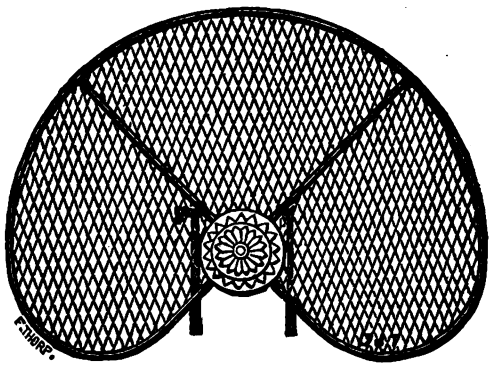
NEW PATTERN.



IMPROVED CIRCULAR-SHAPED FIRE GUARD

CHEAP, STRONG, AND DURABLE.

No. 1,090.	20-inch.	22-inch.	24-inch.
Japanned Blue	1/0	1/3	1/6 each
Tinned Wire	1/6	1/11	2/3 ,,
Brass Wire, with Rosette in Centre ..	3/3	3/9	4/3 ,,

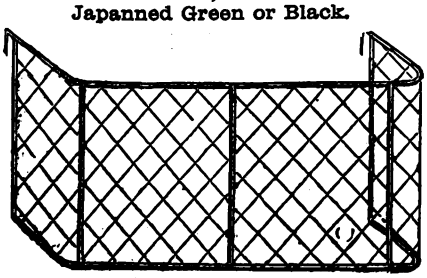


BRASS FIRE GUARDS.

These have a Handsome Appearance, and are very Low in Price.

No. 844.	22-inch.	24-inch.
Brass Wire, with Plain Brass Beading all round.	5/6 each.	6/- each.

No. 1,023.
Japanned Green or Black.



2 ft. 3 in. high.

CHEAP NURSERY GUARDS.

GREATLY REDUCED PRICES.

The Cheapest and Most Useful Article of the kind in the Market.

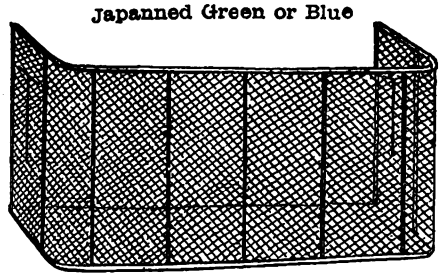
Made of Strong Corrugated Diamond Lattice.

1 INCH MESH ON A $\frac{5}{16}$ INCH ROD FRAME.

Singly, or in nests of Six sizes as follows.

2 ft. 9 in.	3 ft. 0 in.	3 ft. 3 in.	3 ft. 6 in.	3 ft. 9 in.	4 ft. 0 in. long.
2/8	2/9	2/11	3/-	3/2	3/3 each.

No. 316a.
Japanned Green or Blue



DIAMOND PATTERN NURSERY GUARDS.

WITH BRASS TOPS AND SHEET IRON BOTTOMS.

Greatly Reduced Prices. Made only in the following Sizes.

High. ft. in.	Projection. in.	2 ft. 6 in. s. d.	2 ft. 9 in. s. d.	3 ft. s. d.	3 ft. 3 in. s. d.	3 ft. 6 in. s. d.	3 ft. 9 in. s. d.	4 ft. long s. d.
2 0	10	9 0	9 6	10 0	10 6	11 8	12 6	13 6 each
2 3	10	10 6	11 0	11 6	12 0	13 2	14 0	15 0 ,,
2 6	10	12 0	12 6	13 0	13 6	14 9	15 6	16 6 ,,

ILLUSTRATED LISTS WITH TRADE TERMS ON APPLICATION.

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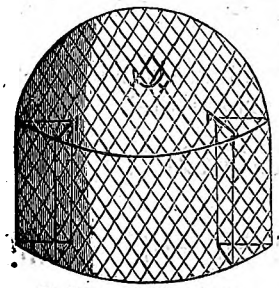
J. J. THOMAS & CO., Manufacturers, 360 & 362, EDGWARE ROAD, LONDON.

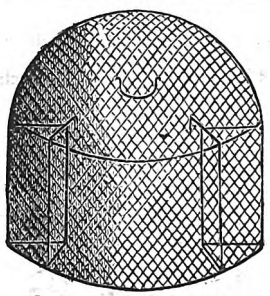
CIRCULAR DOME TOP FIRE GUARDS.

CORRUGATED DIAMOND PATTERN. GREATLY REDUCED PRICES.



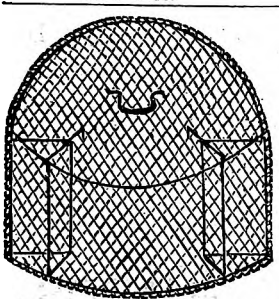
In Japanned, Tinned, or Brass Wire.

		Prices each. 12 in.	14 in.	16 in.	18 in.	20 in.	22 in.	24 in.
No. 300a. Five-eighth inch Mesh.	Japanned Blue ...	6d.	7d.	8d.	10d.	1/0		
No. 300. Half-inch Mesh. These are a much stronger Guard than the No. 300a.	Japanned Blue ...	8½d.	9d.	10½d.	1/1	1/3	1/7	1/11
	Tinned Wire	11d.	1/0	1/3	1/6	1/10	2/3	2/9
	Brass Wire	2/3	2/8	3/2	3/9	4/6	5/3	6/0
	Brass Wire with Brass Beading all round	4/9	5/0	5/6	6/2	7/0	8/3	10/0



In Japanned, Tinned, or Brass Wire.

		Prices each. 14 in.	16 in.	18 in.	20 in.	22 in.	24 in.
No. 301. Three-eighth inch Mesh. These are much finer in the Mesh than the above.	Japanned Blue ...	11d.	1/1	1/3	1/6	1/9	2/2
	Ditto Extra Strong ...	1/0	1/3	1/6	1/9	2/0	2/6
	Tinned Wire ...	1/4	1/6	1/8	2/0	2/6	3/0
	Ditto Extra Strong ...	1/6	1/9	2/0	2/6	3/0	3/6
	Brass Wire	3/0	3/6	4/0	4/9	5/9	7/0
	Ditto Extra Strong ...	3/6	4/0	4/6	5/6	6/6	8/0

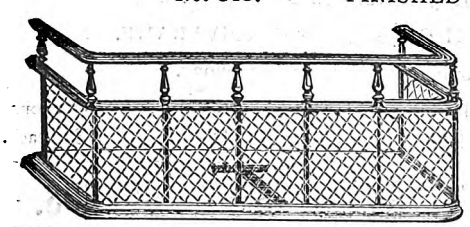


These three pattern Guards are very strong and durable, and have a rich and handsome appearance.

	Prices each. 14 in.	16 in.	18 in.	20 in.	22 in.	24 in.
No. 302. Three-eighth inch Mesh. With Plain Brass Beading all round the Guard.	6/6	7/0	7/6	8/9	10/3	12/0
No. 303. Three-eighth inch Mesh. With Brass Moulding all round the Guard.	6/9	7/6	8/3	9/3	10/6	12/6
No 310. Three-eighth inch Mesh. With Twisted Brass Beading all round the Guard.	7/3	7/8	9/3	10/6	12/0	13/6

BRASS FENDERS.

No. 313. FINISHED IN A VERY SUPERIOR MANNER.



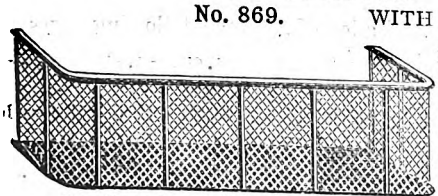
With Brass Tops, Broad Brass Mouldings, Ornamental Brass Ballisters, Black Iron Bottom Plate, and Wired with Double Diamond Pattern Lattice, with Poker Stops complete.

High in.	Projection. in.		Blued 2 ft. 6 in. £ s. d.	2 ft. 9 in. £ s. d.	3 ft. £ s. d.	3 ft. 3 in. £ s. d.	3 ft. 6 in. £ s. d.	3 ft. 9 in. £ s. d.	4 ft. long. £ s. d.
15	12	Wire lattice	1 9 0	1 11 0	1 13 0	1 15 0	1 17 6	2 0 0	2 2 6
		Brass Wire lattice	1 14 0	1 17 0	2 0 0	2 3 0	2 6 6	2 10 0	2 13 6

Brass Knobs on Top Rail for Fire Irons, 3s. each Fender Extra.

CHEAP WIRE FENDERS.

No. 869. WITH BRASS TOPS AND SHEET IRON BOTTOMS.



For Bedrooms, Bathrooms, &c.

High ft. in.	Projection. in.	2 ft. 6 in. s. d.	2 ft. 9 in. s. d.	3 ft. s. d.	3 ft. 3 in. s. d.	3 ft. 6 in. s. d.	3 ft. 9 in. s. d.	4 ft. long. s. d.
0 9	9	5 8	6 0	6 9	7 6	8 3	9 0	9 9 each
1 0	9	6 5	6 9	7 6	8 3	9 0	9 9	10 6 "
1 3	9	7 2	7 6	8 3	9 0	9 9	10 6	11 3 "
1 6	9	7 5	8 3	9 0	9 9	10 6	11 3	12 0 "
1 9	9	8 8	9 0	9 9	10 6	11 3	12 0	12 9 "

Japanned Green or Blue. [9]

ILLUSTRATED LISTS WITH TRADE TERMS ON APPLICATION.

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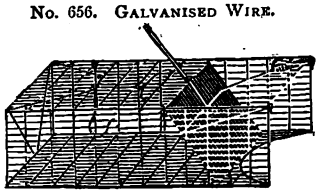
J. J. THOMAS & CO., Manufacturers, 360 & 362, EDGWARE ROAD, LONDON.

RAT AND MOUSE TRAPS. GREATLY REDUCED PRICES.

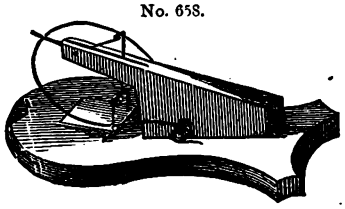
RAT TRAPS.

No. 656. GALVANISED WIRE.



14 inches long .. .. .. 2s. od. each.
16 ,, ,, ... 2s. 6d. ,,
18 ,, ,, ... 3s. od. ,,
Double ditto, with door at each end.
24 inches long .. .. .. 5s. 3d. ,,
28 ,, ,, ... 6s. od. ,,

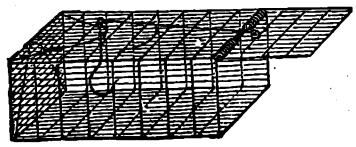
No. 658.



A VERY USEFUL TRAP WITH POWERFUL SPRING.

In Deal .. .. .. 11s. 6d. per doz.
In Beech .. .. .. 22s. 6d. ,,

No. 657. GALVANISED WIRE.



12 inches long .. .. .. 2s. od. each.
14 ,, ,, ... 2s. 6d. ,,
16 ,, ,, ... 3s. od. ,,
Double ditto, with door at each end.
20 inches long .. .. .. 5s. 3d. ,,
24 ,, ,, ... 6s od. ,,
28 ,, ,, ... 6s. 9d. ,,

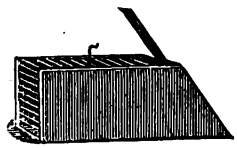
No. 656 has a Plate Iron Door or Fall, with a Wire Clip, so as to secure the door from being opened by the Rat when inside, however powerful he may be. This contrivance is very simple, and cannot possibly get of order. This trap is strongly recommended.
No. 657 is a strong Wire Trap, with an improved spring on the top of the door. No. 658 kills the Rat instantly.

MOUSE TRAPS.

Round Wire Mouse Trap.
No. 661.

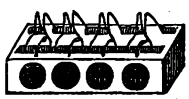
Tinned Wire, 4½ in. in diameter.
Price 9/9 per doz.

Wood Mouse Trap.
No. 662.



Single Entrance (1d.) 9/9 per gross.
,, ,, (2d.) 18/- ,,
,, ,, (4d.) 45/- ,,
Best Make.
Double Entrance, 45/- & 60/- per gross.

Irish Mouse Trap.
No. 663.

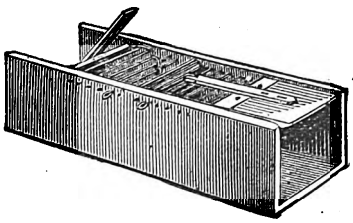


	Beech	Deal.
3 holes	6/9 ..	3/9 per doz.
4 ,,	9/- ..	5/3 ,,
5 ,,	11/3 ..	6/9 ,,
6 ,,	12/6 ..	9/- ,,

Wood Mouse Trap.
With Strong Spring.
No. 664.

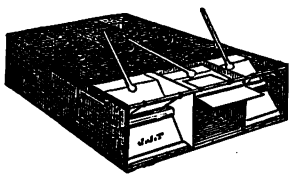
Price 4/6 per dozen.

Hard Wood Double Mouse Trap.
No. 726.



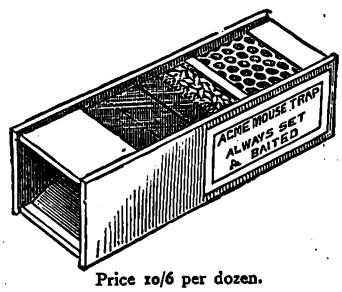
Price 4/6 per dozen.

The XL Mouse Trap.
Wove Wire, Japanned, in three Compartments.
No. 666.



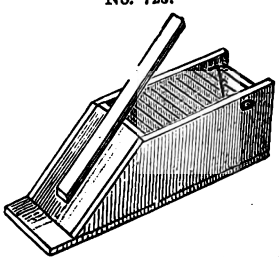
Price 15/- per dozen.

The "Acme" Mouse Trap.
No. 727.



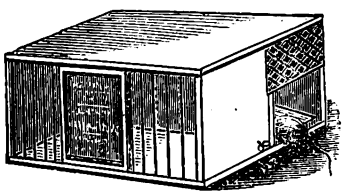
Price 10/6 per dozen.

Improved Single Mouse Trap
No. 728.



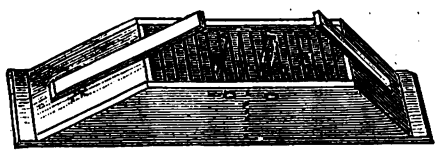
Hard Wood .. .. .. 4/- per dozen.
Soft Wood .. .. .. 3/6 ,,

Perpetual Mouse Trap.
No. 665.



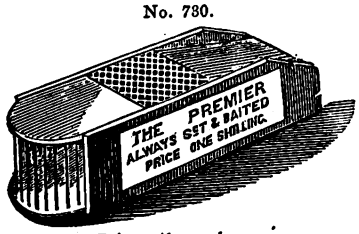
Price 11/6 per dozen.
Will catch 8 to 10 mice at a time.

Improved Double Mouse Trap.
No. 729.



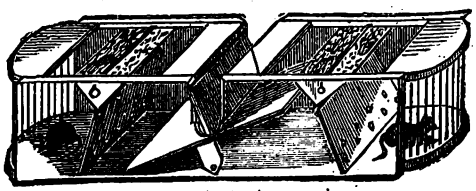
Hard Wood .. .. 5/- per dozen.
Soft Wood .. .. 4/- ,,

The "Premier."
No. 730.



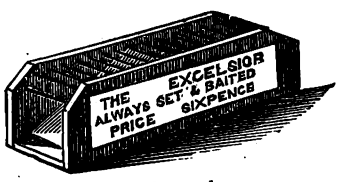
Price 7/6 per dozen.

Perpetual Mouse Trap.
No. 660.



Will catch 12 mice at a time.
Price 16/6 per dozen.

The "Excelsior."
No. 731.



Price 4/6 per dozen.

ILLUSTRATED LISTS, WITH TRADE TERMS, ON APPLICATION.

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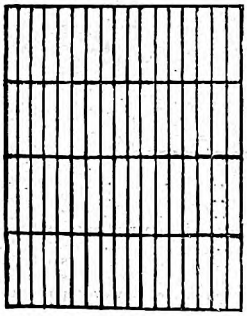
J. J. THOMAS & CO., Manufacturers, 360 & 362, EDGWARE ROAD, LONDON.

GALVANIZED WIRE LATTICE, of every Description.

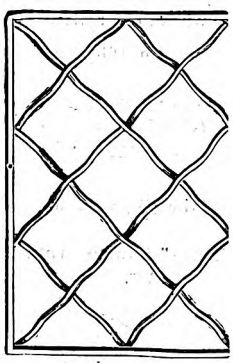


STRAIGHT PATTERN. PRICES PER SUPERFICIAL FOOT. GALVANIZED AFTER MADE.

Mesh.	Mostly used for	No.	Wire Gauge. 18	17	16	15	14	13	12	11	10	9	8
3-32 in.	Fly Proof Lattice for Larders, &c.		15d	—	—	—	—	—	—	—	—	—	—
1-8 in	" " "		—	14d	15d	—	—	—	—	—	—	—	—
3-16 in.	Fire Guards		—	10d	12d	14d	—	—	—	—	—	—	—
1-4 in.	Aviaries and Window Guards ..		—	—	9d	10d	11d	12d	—	—	—	—	—
3-8 in.	" " " ..		—	—	—	6d	7d	8d	9d	—	—	—	—
7-16 in.	" " " ..		—	—	—	5½d	6½d	7½d	8½d	—	—	—	—
1-2 in.	Skylights, &c.		—	—	—	5d	6d	7d	8d	—	—	—	—
5-8 in.	"		—	—	—	—	5½d	6½d	7½d	8½d	9½d	—	—
3-4 in.	Pheasantries		—	—	—	—	—	6d	7d	8d	9d	11d	—
1 in.	"		—	—	—	—	—	5d	6d	7d	8d	9d	10d
1½ in.	Iron Railings to prevent Cats and Dogs getting through		—	—	—	—	—	5d	5½d	6½d	7½d	8½d	9½d
1¾ in.			—	—	—	—	—	—	5½d	6d	7d	8d	9d
2 in.	Hen Coops and Fowl Pens ..		—	—	—	—	—	—	5d	5½d	6d	7d	8d

Straight Wire Lattice for Aviaries should be made of Tinned Wire. It has a bright and smooth surface, and has all the appearance of plated wire. Copper Wire Lattice for Church and School-room Windows made to order. Estimates on application.

CORRUGATED DIAMOND LATTICE, No. 73.

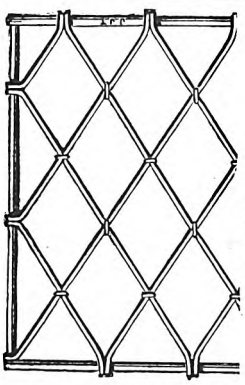


With strong frame all round, and made in pieces of any required dimensions.

PRICES PER SUPERFICIAL FOOT, PAINTED OR GALVANIZED,

Mesh.	No.	Wire Gauge. 19 d	18 d	17 d	16 d	15 d	14 d	13 d	12 d	11 d	10 d	9 d
⅜ in.		6	7	8	—	—	—	—	—	—	—	—
½ in.		5	6	7	—	—	—	—	—	—	—	—
⅝ in.		4	5	6	7	—	—	—	—	—	—	—
¾ in.		—	4	5	6	7	—	—	—	—	—	—
1 in.		—	—	—	4½	5	5½	6½	8	—	—	—
1½ in.		—	—	—	—	4	4½	5½	6½	7½	8½	—
2 in.		—	—	—	—	—	4	4½	5½	6½	7½	8½
2½ in.		—	—	—	—	—	3½	4	4½	5½	6½	7½
4 in.		—	—	—	—	—	—	3	3½	4	4½	5

PLAIN WIRE DIAMOND LATTICE, No. 74.

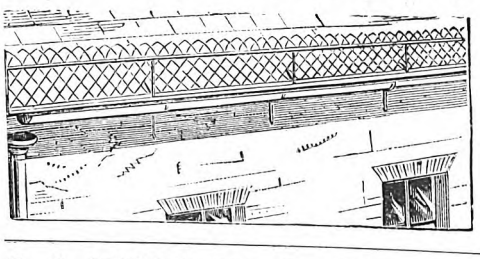


PRICES PER SUPERFICIAL FOOT, PAINTED OR GALVANIZED.

Size of Mesh.	No.	Wire Gauge. 15 d.	14 d.	13 d.	12 d.	11 s. d.	10 s. d.	9 s. d.	8 s. d.
1 in.		8	9	10	11	1 0	1 2	1 4	—
1¼ in.		—	8	9	10	0 11	1 1	1 3	—
1½ in.		—	7	8	9	0 10	1 0	1 2	1 4
2 in.		—	5	5½	6	0 7	0 8	0 10	1 0
2½ in.		—	—	4½	5	0 5½	0 6	0 7	0 9
3 in.		—	—	4	4½	0 5	0 5½	0 6	0 7
4 in.		—	—	3	3½	0 4	0 4½	0 5½	0 6½
6 in.		—	—	—	2	0 3	0 4	0 5	0 6

Pieces measuring less than four feet charged at per piece. All measurements under one foot charged as one foot.

EXTRA STRONG WIRE SNOW GUARDS, No. 655.



To Prevent the Snow falling from the Roof on to a Conservatory or Skylight, made any length up to 9-ft.

6-ft. LENGTHS ONLY, KEPT IN STOCK.

	6 in.	9 in.	12 in.	15 in.	18 in. high.
Price ...	8d.	9d.	10d.	1/-	1/3

Per Running Foot.

GALVANISED IRON SUPPORTS, 3-ft. apart, 6d. each extra.

These Snow Guards are made on Strong Iron Rod Frames, and covered with strong Wire Lattice No. 10 W.G. 1-in. mesh, diamond pattern, with ornamental top.

ILLUSTRATED LISTS WITH TRADE TERMS ON APPLICATION.

J. J. THOMAS & CO., 360 & 362, EDGWARE ROAD, LONDON.

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LONDON FIRE APPLIANCE CO.'S

NEW PATENT IMPROVED

CONDENSING STOVES

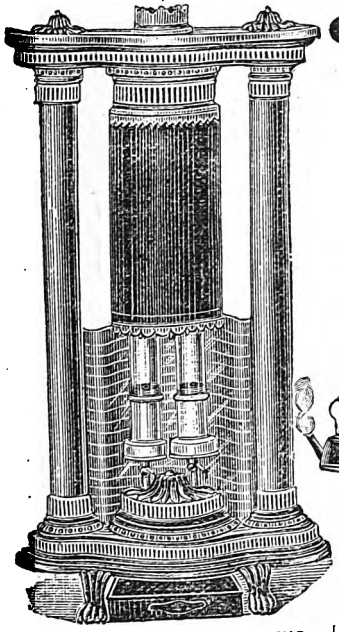
FOR GAS AND OIL.

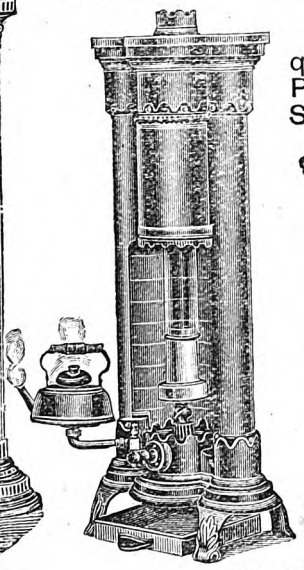
NO FLUE REQUIRED — Can be fitted up anywhere.

Cost of Burning per hour **ONE-FIFTH** that of Gas Fires, Asbestos Stoves, &c.

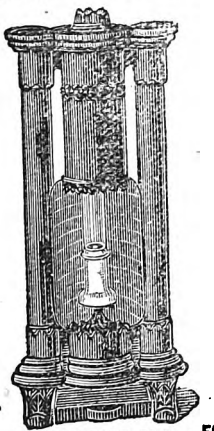
ABSOLUTELY NO SMELL — No Dry, Stifling Air.

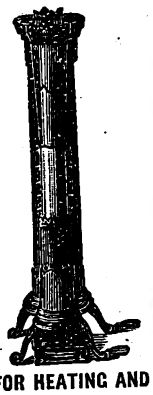
GAS STOVES

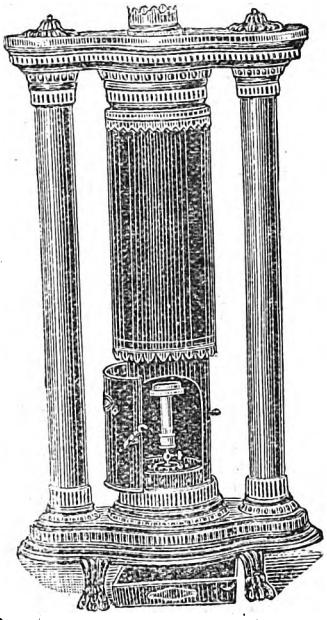




N.B.—The Prices here quoted are for Stoves with POLISHED COPPER SIDE COLUMNS.







FOR HEATING AND LIGHTING.

No. 4.—Price £7 5s.

Height 50-in.; breadth, 27-in.; depth, 15-in. Two improved Argand burners. 14-ft. per hour at full pressure. For apartments up to 40-ft. by 24-ft. Much used in Entrance Halls, Large Shops, Banks, Public Offices, Superior Conservatories, Halls, Schoolrooms, &c., &c,

HANDY BOILING BRACKET.

Any of our Gas Stoves can fitted with a swinging bracket for boiling hot water, heating milk, &c., as shown above. **Price 7/6 extra.** The exceeding usefulness of this is apparent, It has been found indispensable in Nurseries, Shops, Offices, &c.

FOR HEATING AND LIGHTING.

No. 6.—Price £3. Height, 33-in.; breadth, 14½-in.; depth, 9-in. Improved Argand burner. 6 feet per hour at full pressure. For Apartments up to 16-ft. by 10-ft.

No. 2.—Price £4. Height, 40-in.; breadth, 17-in.; depth 12-in. Improved Argand burner. 7½ feet per hour at full pressure. For Apartments up to 24-ft. by 16-ft.

FOR HEATING AND LIGHTING.

No. 1.—Price £2 5s. Height, 33-in.; breadth, 10½-in.; depth, 10½-in. Improved Argand burner. 6 feet per hour full on. Made entirely of cast iron and sheet copper. Unequalled for small greenhouses.

FOR HEATING ONLY.

No. 5 .. .. .. Price £3
No. 7 .. .. .. Price £4
No. 3 .. .. .. Price £6 10s.

Same measurements, consumption of gas, and heating power as Stoves Nos. 6, 2, and 4 respectively.

These Heating Only Stoves are fitted with PATENT SAFETY BUNSEN BURNERS, which are incapable of "lighting back."

SUPERIOR FITTINGS. WELL-MADE THROUGHOUT SUPERIOR FINISH.

N.B.—No Extra for Copper Pillars.

One Trial and Comparison with others Solicited.

SATISFACTION TO BUYER & SELLER GUARANTEED.

THESE STOVES MEET A LONG FELT WANT.

Gas Stoves, hitherto, having a flue or chimney connection, have proved themselves to be most expensive, both in the fitting up and, the heat obtainable being only from radiation, in the cost per hour of the gas they consume. **Four-fifths** of the heat from the gas passes up the chimney and is **lost**, thus necessitating a much larger consumpt of gas than is necessary to obtain the desired heat. As a result the cleanliness and labour-saving advantages possessed by gas as a heating agent were rendered practically prohibitive by heavy gas bills. Moreover, if there is a **down draught**, all Stoves requiring a flue are subject to the same disadvantages as a coal fire.

In our PATENT IMPROVED CONDENSING STOVES these **reasonable objections** have been **entirely overcome.** Requiring neither flue nor chimney connection, they **can be fitted up anywhere,** at the mere cost of leading the gas to them, which is usually very little, as the consumpt of gas being so small a pipe direct from the meter is seldom required. They can be used at any time, irrespective of weather. No heat escapes up the chimney—**full benefit of all the gas or oil consumed is obtained**—consequently the cost to the consumer is about **one-fifth** that of Gas Fires, Asbestos Stoves, &c. **The combustion being perfect there is NO SMOKE.** The construction of the Stoves renders it IMPOSSIBLE that any fumes should be emitted. All noxious vapours, arising from the combustion of gas or oil, pass up from the flame, cross the two bridges at the top of the Stove, pass down the two side columns into the lower chamber, where they are COMPLETELY CONDENSED, and drop into the tray beneath in the form of a liquid devoid of smell, and containing a large amount of free sulphur.

THE LONDON FIRE APPLIANCE CO., 126, BUCHANAN STREET, GLASGOW.

(SEE NEXT PAGE).

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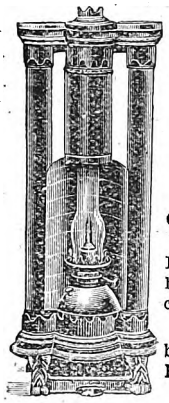
OIL STOVES.

These patent Stoves must not be associated with the ordinary cheap Oil Stoves in the market, which, besides being often smoky and troublesome, afford comparatively little heat and a penetrating sickly smell, causing them to be almost invariably discarded after a few vain attempts to obtain satisfaction from them. Unlike such Stoves, those here offered give

A Genuine Strong Heat, A Very Bright Light, and Emit Positively No Smell.

The heat is generated by the hottest and purest burning oil lamp in the world, and, as the condensing arrangement is the same as in the Gas Stoves, the deleterious elements are completely neutralized, as is plainly visible in the liquid deposited in the tray, thus nothing but a strong current of pure hot air is allowed to pass into the apartment.

When these Stoves are not in use the Lamp can be taken out and used as a Reading Lamp, giving a light of 62 and 120 candle-power respectively.



No. 6. ... Price £3 10 0

No. 2. ... Price £4 10 0

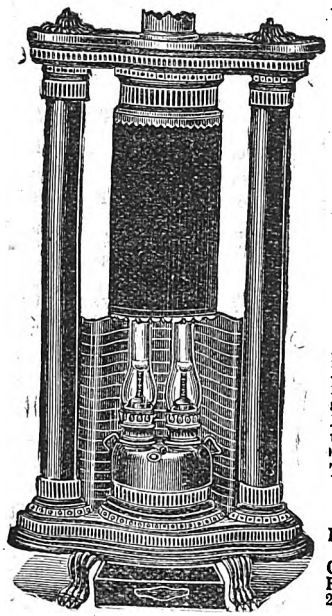
(Including Polished Copper Pillars),

FOR HEATING AND LIGHTING.

Same Measurements and Heating Power as Gas Stoves of same sizes.

Fitted with strong British-made Central Draught, Circular Wick, Burnished Copper Lamp, holding 10 gills and burning, with one filling, continuously for 12 hours.

Very Suitable for **Entrance Halls, Lobbies, Bed Rooms, Shops, Offices, Business Premises, Conservatories,** etc., etc.



No. 4.

Price ... £8 5 0

(Including Polished Copper Pillars),

FOR HEATING AND LIGHTING.

MEASUREMENT.

Height, 50 inches.

Breadth, 27 inches.

Depth, 15 inches.

Fitted with one large burnished Copper Oil Container, holding one gallon and having two burners each of same size as in No. 2 Stove. Burns, with one filling, continuously for 20 hours.

This is a Handsome and very Powerful Stove.

Suitable for **Entrance Halls, Billiard Rooms, Conservatories, Churches, Halls, School Rooms,** etc., up to 40 by 24 feet.

CONVERTIBLE STOVE.

BURNS EITHER OIL OR GAS.

With Oil it is the same Stove as No. 2 Oil; with Gas it is the same as No. 2 Gas Stove.

PRICE £5.

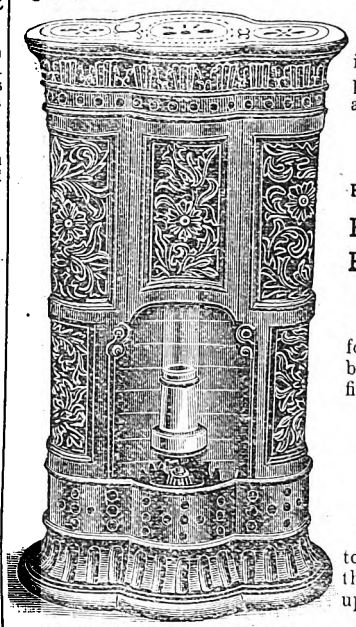
Including all the fittings necessary for Gas and Oil, so arranged that the Stove can be easily converted from one to the other.

ARTISTIC

DOULTON WARE COMBINATION.

(PATENTED.)

To meet the demand for an extra Handsome Stove, suitable for superiorly furnished Apartments of all kinds, we have introduced and patented the Stove here shown. It consists of a No. 2 Stove of a special pattern, and a cover of Doulton Ware, designed and produced by Doulton and Co. in their best style. For convenience in handling the cover is made in three pieces, which fit accurately and imperceptibly together.



This Combination is exceedingly handsome and could be placed anywhere, no matter how artistic the surroundings.

PRICES

FOR STOVE & COVER COMPLETE.

For Gas ... £7 15 0

For Oil ... £8 5 0

Convertible for Gas or Oil, with both Gas and Oil fittings complete. £8 15 0

MEASUREMENT, Over all

Height, 39 inches.
Breadth, 22 inches.
Depth, 13 inches.

When in operation, in addition to the usual current of hot air from the Stove, the cover becomes heated up and radiates a genial warmth.

CHEMICAL FIRE EXTINGUISHERS.

"L'EXTINCTEUR," DICK'S "FIRE QUEEN."
DICK'S "LITTLE FIRE QUEEN."

ALSO THE NEWEST

THE "LION" PATENT HAND FIRE EXTINGUISHER.

PRICE 48/- PER DOZ.

96 HIGHEST AWARDS.

OVER

165,000

Have been Sold.

BEWARE OF IMITATIONS.

See that the name

W. B. DICK

is on every machine.

Genuine only from the direct representatives of the original inventor, patentee, and sole manufacturer, W. B. Dick.

Prices from 12/6 each

Prices from 70/- each.

THE LONDON FIRE APPLIANCE CO., 126, BUCHANAN STREET, GLASGOW.

From whom illustrated descriptive lists with full particulars of the Patent Condensing Stoves and Fire Extinguishing Appliances, may be had post free on application.

SHOW ROOMS—

66, Queen Victoria St E.C. LONDON.

126, Buchanan St. GLASGOW.

16, Market Place, MANCHESTER.

[See preceding page.

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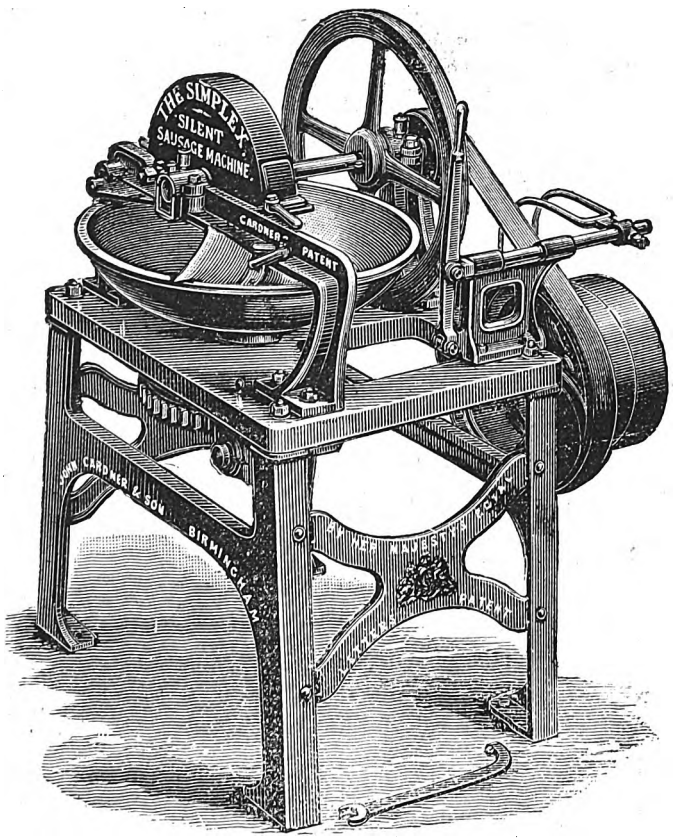
JOHN GARDNER & SON,

Engineers & Pork Butchers' Machinery Manufacturers,

SMITHFIELD WORKS, BIRMINGHAM.

The "SIMPLEX" Silent Sausage Machine, for Steam Power.



THIS MACHINE is universally acknowledged the most perfect Silent Sausage Machine in existence.

Illustrated Price List and Full Particulars on Application.

SPECIAL TERMS TO MERCHANTS & SHIPPERS.

TELEGRAPHIC ADDRESS—"SIMPLEX, BIRMINGHAM."

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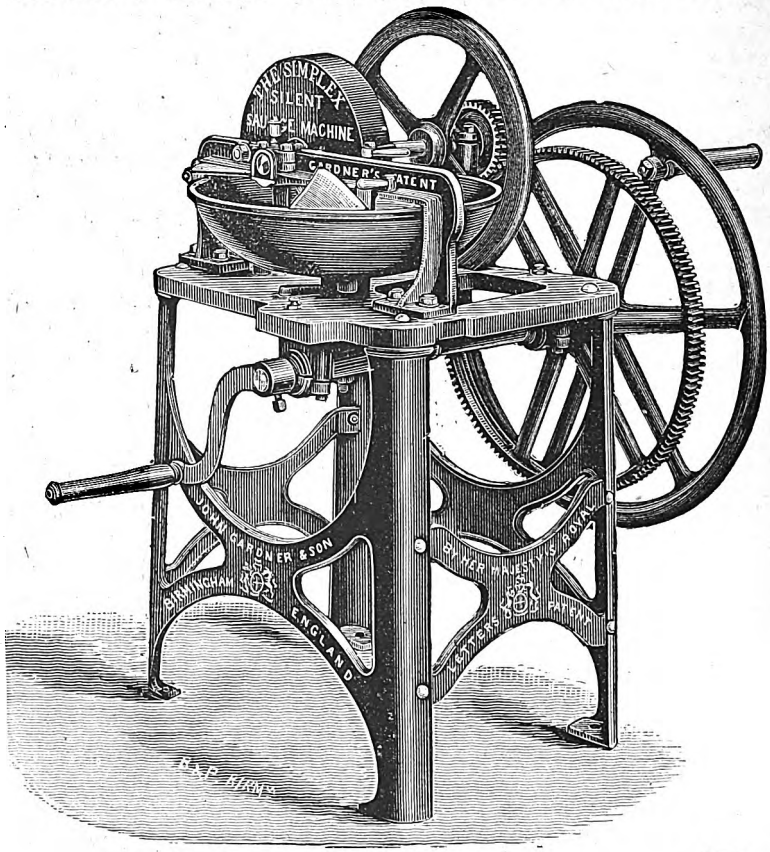
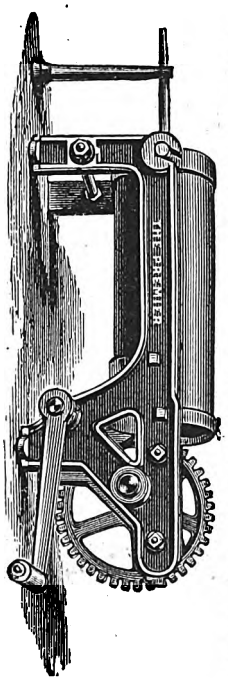
JOHN GARDNER & SON, Patentees and Sole Makers, SMITHFIELD WORKS, BIRMINGHAM.

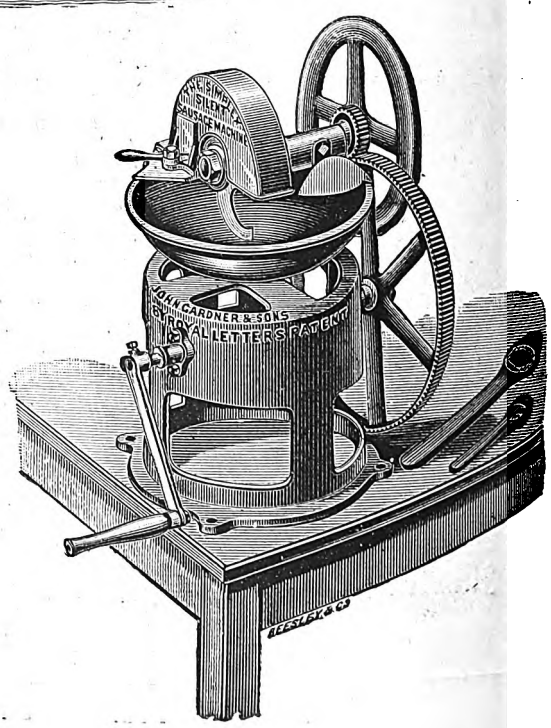
THE "SIMPLEX" SILENT SAUSAGE MACHINE FOR HAND POWER.



THE "PREMIER" SAUSAGE FILLING MACHINE.



THE "SIMPLEX" SILENT SAUSAGE MACHINE FOR HAND POWER.



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FOUR

Sydney, 1879.

Melbourne, 1880.

CR[illegible]D,

WHOLESA[illegible]RERS

And GL[illegible]NTS,

62, SOUTHWARK ST., LONDON, S.E.

Apply for our Handsome Catalogue, over 2,500 Illustrations, and Colour Sheets of Mats, Enamels, Brushes, Sundries, and Novelties, if you have not got one.

Chest Awards.

Adelaide, 1881.

Christchurch (N.Z.) 1882.

BECAUSE
1—They keep Brushes perfectly straight when not in use.
2—They prevent Varnish Brushes resting in the dirty oil sediment.

Buy all your Paint and Varnish Brushes fitted with

OATES' PATENT SUSPENDERS.

WHICH ARE FITTED ON ALL CROWDEN & CARROD'S

"FALCON"

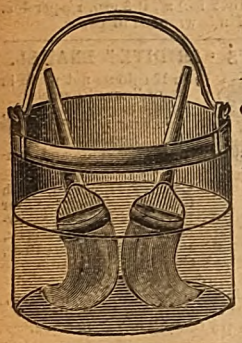
REGISTERED.

PAINTING BRUSHES.

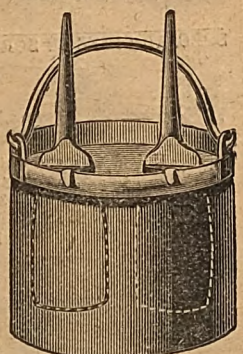
where practicable.

BECAUSE
3—They are very useful on all scaffold work to prevent Brushes rolling off.
4—Brushes cannot slip overhead in paint, &c., &c.

C. & G. are Sole Proprietors of OATES' PATENT, and they have protected it in United States, Canada, and in most of the Continental and Australasian States, Cape of Good Hope, &c.



Old Method.



Improved Method.

BRUSHES THAT WILL NOT TWIST.

SASH TOOLS, STRING BOUND. Class B.

Discounts as usual.

Each Sash Tool wrapped in paper and packed in boxes.

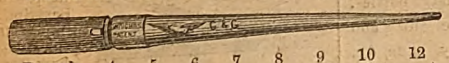
	0	1	2	3	4	5	6	7	8	9	10	12
The "FALCON" String Bound ..	2/	2/6	3/	4/	5/6	7/6	10/	13/	16/	20/	25/	30/ per doz.

WRIGHT'S PATENT COPPER-BAND INDESTRUCTIBLE PAINTING BRUSHES,

Recommended for Hot Climates.

Made by Machinery without cement, guaranteed to stand Varnish, Spirit, Oil, Turps, Glue, &c., as well as Paint.

WRIGHT'S PATENT SASH TOOLS.



	4	5	6	7	8	9	10	12
Round Per doz.	5/6	7/6	10/	13/	16/	20/	25/	30/

PATENT GROUND BRUSHES.

	8/o	6/o	4/o	3/o	2/	o
Round	61/	54/	49/	45/	36/	33/

STRING-BOUND, GROUND BRUSHES.

	8/o	6/o	4/o	3/o	2/o	o	1	2	3	4
	58/	51/	46/	42/	33/	30/	24/	20/	16/	13/

METAL WIRE BOUND GROUND BRUSHES.

	8/o	6/o	4/o	3/o	2/o	o	1	2	3	4
Round	58/	52/	46/	42/	33/	30/	24/	20/	17/	14/

PATENT OVAL VARNISH SASH TOOLS.

Bevelled

	4	5	6	7	8	9	10	12
Copper Band	8/	10/	13/	16/	20/	24/	28/	34/

Pat. Oval Nickel-Plated Varnish Brushes.

Ebonised Handles.

The "Prince" All Lily	27/	33/	42/	48/
The "Queen" do. stiffer	30/	36/	45/	54/

ONE KNOT OVAL GROUND BRUSHES.

Copper Wire bound.

A. Patent Suspender.

8/o	6/o	4/o	3/o	2/o
56/	51/	46/	42/	32/

Small Series.

o	1	2	3	4
23/	24/	20/	16/	12/

DISCOUNTS AS USUAL.

NO EXTRA COST FOR OATES' PATENT.

WRIGHT'S PATENT SASH TOOLS.

	4	5	6	7	8	9	10	12
Oval Per doz.	6/6	8/6	11/	14/	17/	21/	26/	31/

PATENT GROUND BRUSHES.

	8/o	6/o	4/o	3/o	2/o	o
Oval	63/	56/	51/	47/	38/	34/

COPPER WIRE BOUND GROUND BRUSHES.

	8/o	6/o	4/o	3/o	2/o
Square Oval	64/	55/	51/	47/	38/

METAL WIRE BOUND GROUND BRUSHES.

	8/o	6/o	4/o	3/o	2/o	o	1	2	3	4
Oval	60/	53/	48/	44/	35/	31/	25/	21/	18/	15/

PATENT OVAL VARNISH BRUSHES.

Bevelled.

	6/o	4/o	3/o	2/o
Copper Band	61/	57/	53/	45/

METAL WIRE-BOUND VARNISH BRUSHES.

Bevelled.

	6/o	4/o	3/o	2/o	o	1	2	3	4
Oval	58/	54/	50/	42/	36/	30/	27/	22/	18/

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CROWDEN & [illegible] HOUSEHOLD [illegible]

Apply for Special List, or apply [illegible]

SPECIAL LINES IN STOVE BRU[illegible]

In 8 assorted patterns.

Wonderful value, from 4/6 to 12/- per doz.

SPECIAL LINES IN SHOE BRUSHES.

In sets of 3, hard, soft, and polishing, from 4/6 per doz.

SPECIAL LINES IN SCRUBBING BRUSHES.

SOLID BACKS

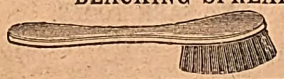
Union, bass, and white fibre mixed.
9¾in. backs, 4/6 per doz. or 51/ per gro.; 9in. backs, 3/3 per doz. or 36/ per gro.

SPECIAL LINES IN SOLID WHISK DANDY.

Best value in the Trade.

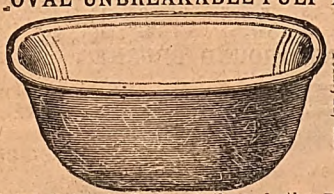
5/, 6/6, 7/6, and 8/6 per doz.

BLACKING SPREADERS.



Best quality only.
Black Hair, 4/ per doz.

OVAL UNBREAKABLE PULP TUBS.



For Washing Glasses, China, Plate, &c., or can be used as a Footbath, Enamelled White inside. 16in., 21/ doz.

Pulp Bowls, Basins, Pails, and other Pulpware.

C. & G.'s Varnish Stains.

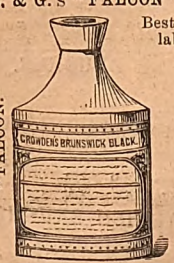
A Combined Stain and Varnish for renewing Furniture and all kinds of Woodwork, also for staining wood, producing a brilliant surface in a few minutes. Oak, Mahogany, Rosewood, Satinwood, and Ebony.

In large 6d. btls. capsuled, 4/ per doz.
" 1/ " " 8/ "

Rudman's Stainoleum, in Oak, Mahogany, &c. as above 4/ "

C. & G.'s "FALCON" BRUNSWICK BLACK.

Best quality only, Handsome labels. Extra large bottles.



½pint 3/6 doz, or 39/ gro.; ½pint 7/ doz., or 78/ gro. | With wide mouths complete with brush, 4/- doz.
C. & G.'s BERLIN BLACK, large sizes 6d. 3/6; 1/, 7/ "

		6/	3/6
		10/	5/6
by 6	.. ..	12/	7/
30 by 6	.. ..	16/	8/6
36 by 6	.. ..	20/	11/

per doz.

"FALCON" KNIFE POLISH.

Specially prepared for above Boards.

6d. 1/ Retail.
3/7 7/3 per doz.

HOUSEHOLD GLUE POTS.

Complete with Brush.

Nicely got up.

Best Quality Glue.

Large Size, in boxes of 1 doz.

3/

per doz.

C. & G.'s "FALCON" SEWING MACHINE OIL.

Best quality. In extra large bottles.
Recommended for cleaning and oiling all machinery, guns, &c.
In boxes of 1 doz. 6d. bottles,
3/ per doz.

JOB LINES IN TWINE.

200 dozen Middle Thread, Hemp in 8oz. balls.
No. 202. For ordinary shop use, 6/ doz. lbs.
Fine Jute, Dutch Twine in 4oz. balls, finer than above,
No. 206J, 5/6 doz.
Special Prices for quantities.

SPECIAL AGENTS FOR

Mends Everything.

Display Stand GRATIS.

This Display Stand gratis to buyers of 2 doz. 6d. and 1 doz. 1/ tins with Patent Screw Top and adjustable Brush. It will double the sales. In case, complete with show card and advertising matter, 15/, complete.
In boxes of 1 doz. 6d., 3/9; 1s., 7/6 per doz.

SPECIAL AGENTS FOR

ASPINALL'S ENAMEL.

25,000 Tins in stock.

For decorating and making old things look like new.

Our prices are same as Aspinall's.

Ordinary size (2½ by 3½) 9/6 per doz.
Tinlets (1¾ by 2) 3/9.
If 5 gro. 5 per cent. off.

Extra discount for Cash, 5 per cent.

CROWDEN'S HARD ART ENAMEL

Leaves a hard, brilliant and lustrous appearance and gives satisfaction to all who use it.
We introduced this Enamel for those who require a larger quantity for their money.
Ordinary tins (2½ in. by 2½ in.) 4/, if 3 gro. 3/6 per doz.
Tinlets (1¾ in. by 2 in.) 2/, if 3 gro. 1/9 per doz.
Every Tin is wrapped in paper.

CROWDEN'S "IRIDITE" ENAMEL.

In 12 colours not made in ordinary Enamels.
Possesses great brilliancy, having a BRONZE foundation.
Untarnishable and unaffected by heat.

Colours.—Emerald, Rich Gold, Fire, Sapphire, Silver Flour, Crushed Strawberry, Orange, Peacock, Beetle Wing, Vieux Rose, Old Gold, and Citron.

One coat only required, dries as it is applied. Invaluable for Lincrusta, Pottery, Basket Work, Fans, Silk, Satin, Ball Shoes, Sculpture, &c.
In large tins (1¾ in by 2 in.) 4/ per doz.

THE NEW U.S. CLOTHES OR LETTER CLIP.

The Newest, Cheapest and Best Spring Clip yet made; 3¼ in. long, in Show Boxes.

3/6 per gross.

THE "FALCON" SOAP DISH.

Galvanized Iron.

Stands—Hangs—or fixes on tub.

2/4 per doz.

TOOL BASKETS.

C. & G.'s "IMPERIAL," Bound (also Pockets bound) with superior web, superior strong canvas lining, and superior workmanship:—

	Sm.	Mid.	Lge.	X.lge.	XX lge.	
Inches	23	27	30	33	36	
Bnd. sup. web	5/	6/6	7/	8/6	11/	doz.
Lnd. sup. canvas	8/	10/6	12/	14/	17/	"

We recommend these baskets; they will wear twice as long as the ordinary.

C. & G.'s "ORDINARY" Bound as usually sold:—

	Sm.	Mid.	Lge.	Ex.lge.	Ex.ex.lge.	
Bound with web	4/2	5/6	6/6	7/8	9/6	doz.
Lnd. with canvas	6/	8/	10/	11/6	13/6	"

NOTE THE LOW PRICES.

FARO, PAINTER'S, Large 3/11; bound 1/6 per nest.

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C. & G.'s "FALCON" CARPET SWEEPER.

Retail 12/6 each.

Wholesale 9/4 each.
If in quantities 9/- each.

This is the best Sweeper in the market, and combines all the latest improvements. It is the lightest running machine made, and the brushes are readily adjusted and can be removed with ease. It has an India rubber guard round it to prevent injury to furniture, &c. The handle stands upright and is self-supporting when not in use.

The Genuine "Gem" Air Guns.

Best Quality only.

No. 1, 4½ m/m bore..14/ each.
„ 2, 4½ „ ..21/ „
„ 3, 4½ „ ..28/ „

Reduced Prices.

No. 1a, 6¼..m/m bore 14/ each.
„ 2a, 6¼ „ ..21/ „
„ 3a, 6¼ „ ..28/ „

Best Steel Darts.

4½ m/m 8d. per doz. or 7/6 per gross.
6¼ „ 1/4 „ or 15/ „

Best Slugs.

4½ m/m 9d. per m.
6¼ „ 1/6 „

Genuine "Gem" Air Pistols.

Japanned, E.G. 2/8; M.F. 6/3 ea. Nickel, E.G. 4/; M.F. 10/6 ea

Best Plum Wood Taps.

Our quality and thickness of wood (not cherry or beech) is superior to those usually sold, the metal plugs are thicker, and other metal parts screwed and not tacked on.

NIGHT, Strainer Ends.

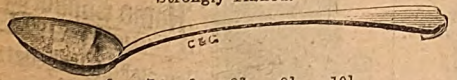
G, No 3, 7¼ in. full..3/2 per doz.
4, 6¾ in. „ ..2/10 „
5, 6½ in. „ ..2/6 „

LOCK, Strainer Ends.

H, No. 3, 7½ in. full..3/8per doz.
4, 6¾ in. „ ..3/4 „
5, 6½ in. „ ..3/ „

Forged Steel Kitchen Spoons.

Strongly Tinned.



6	7	8	8¾	9½	10½
7/6	11/	12/6	20/	22/	24/ per gross.

Basting Spoons,

with Hook to hang, as above.

12	14	16	18
38/	50/	64/	72/ per gross.

CHAIR SEATS.

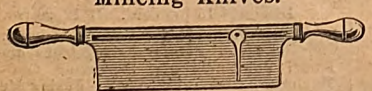
In Round, Square, and all Shapes.

In.	per doz.
13	2/2
14	2/4
15	3/
16	3/9
17	4/2
18	4 6
19	5/
20	6/

Gilt Nails at low prices.

Special Quotation for Quantities.

Mincing Knives.



The "SCRAPER." Fitted with movable scraper to clear the suet which adheres to the blade. 8/4 per doz.

EGG BEATERS.

The "FAMILY" Registered, complete with White lipped Earthenware Jars. 8/6 per dozen.

The Real "DOVER," in boxes of 1 doz. 6/6 per doz. If 1 gro 6/3 doz. The "ACME." 3/ per doz.

The "SPIRAL" Wood Handle, for use in a breakfast cup, very cheap 1/4 per doz.

THERMOMETERS.

No. 106. Porcelain face, Ebonized back. 8/ per doz.

Size larger, 10 in., bold figures, 16/ doz

The "Gardener's Friend," fitted with Indicators. 8/- per doz.

For Uniting and Mending China, Glass, &c.
3d., 18/; 6d, 40/ per gross,
or „ 1/8; „ 3/6 per doz.

Little's Patent Automatic Corks.

Press the top of the stopper with the thumb, holding the rim by the fore and large fingers, as in drawing, then thrust the bottle-neck up to the rim. Removing the pressure, the plug will resume its normal size, offering an effectual bar to gases or liquids.

Will fit any Wine, Claret, Beer, or other Bottles.

On Show Cards of 1 doz., assorted sizes, 4/- per doz.

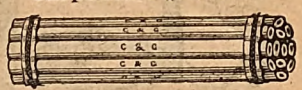
Turnscrews.

Wonderful Line, Imitation Ribbe Rosewood or Ebonized Handles.

8/- per gross.

TACK LIFTERS, 12/- per gross.

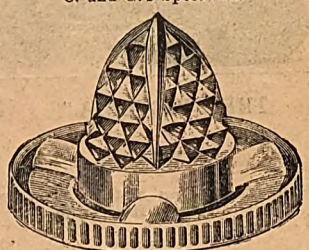
Carpenters' Pencils.



The Best Pencil Sold—every one guaranteed—Carpenters will appreciate them.
Best Oval Cedar, burnished, Stamped "Falcon," 7/ per gross.
White wood, 7 in., 3/; 14 in., 6/ per gross.

Prismatic Glass Lemon Squeezers.

C. and G.'s Specialité.



Hundreds of grosses of this specialit have been sold the last year and have given universal satisfaction. Best quality. 2/ per doz., or 22/6 per gross
If 2 gross. 21/; larger quantities 20/ per gross

WHITE'S PATENT AUTOMATIC COMBINED

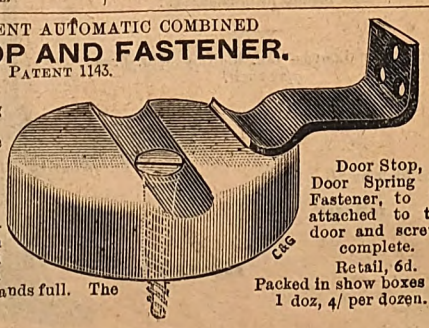
DOOR STOP AND FASTENER.

PATENT 1143.

For Stopping and Fixing House Doors, Shop Doors, Counting-house Doors, &c.

A want supplied.

Prevents slamming. Supersedes wedges, iron porters, dogs, hooks and eyes, &c. Servants can enter a room with their hands full. The action is automatic.



Door Stop, Door Spring or Fastener, to be attached to the door and screws complete.
Retail, 6d.
Packed in show boxes of 1 doz, 4/ per dozen.

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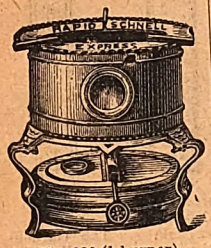
THE NEW "EXPRESS" PETROLEUM COOKING STOVE.

Complete with good burners and strong Tin Lamp.

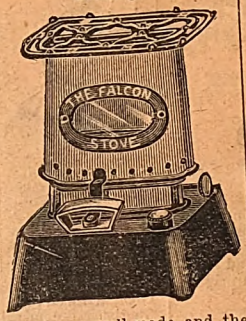


No. 220 (1 burner).
Height .. 6 inch.
Diameter at top, 5½ „
18/ per doz.
No 220A (2 burners), size larger,
24/ per doz.

No. 101 (1 burner).
Height .. .. 7 inch.
Diameter at top .. 7 „
22/ per doz.
No. 104 (2 burners), size larger,
36/- per doz

THE "FALCON" PETROLEUM STOVE,

For Heating, Lighting, and Cooking.



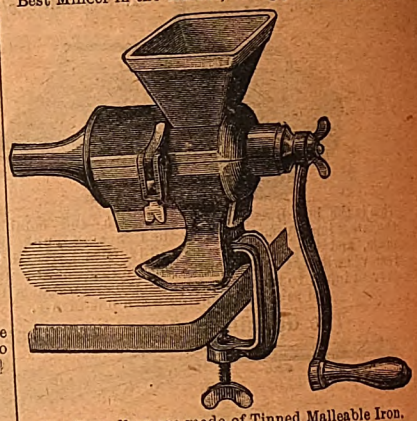
It is strong, well made, and the Oil Container is seamless, so cannot leak or sweat.
3/ each or 33/ per dozen.

THE "BEATRICE."

3/2 each or 36/ per dozen.

C. & G.'s "IMPERIAL" MINCER AND PERFECT SUET CHOPPER.

Best Mincer in the Market, strongly recommended.

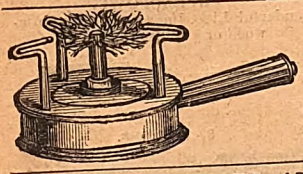


The Propellers are made of Tinned Malleable Iron.

This Mincer is beautifully finished, and includes every improvement possible; Extra large Hopper, Extra large Base, Central Delivery, Porcelain Nozzles

Each in a Wooden Box.
0, 4/3; 1, 5/3; 2, 7/6; 3, 10/6; 4, 21/ each.

All other makes kept in stock.



"RECHAUD" SPIRIT STOVE.

Original Pattern. A, 7/ per doz.

GENUINE RECHAUD.

No.	0	1	2	3
B, Genuine ..	12/	14/	15/	18/ per doz.
D, for Travelling—		20/	30/	— „

THE "RECHAUD ATMOSPHERIQUE" SPIRIT STOVE.

C. & G.'s Registered Pattern.

No. 0.—Maroon Bronze, all in one piece, no brass cup, 1 hole, 4/6 per doz.
No. 1.—Do. as illustrated, with brass cup, 5 tubes, 9/ per doz.
No. 2.—Do. and Brass Relieved, Strong Tubes, 18/ per doz.

Tin Kettles for above, ordinary pints, 3/4; quarts, 4/6 per doz.
Tin Kettles, best quality, improved shape as at side, pints, 6/; quarts, 8/ per doz.

Cup to hold the Methylated Spirits.

HOME COMFORTS.

THE COMPLETE KITCHENER includes—
1 Spirit Stove. 1 Kettle.
1 Frying Pan. 1 Saucepan.
Complete in Fancy Box, 11/3 per doz.

THE "VICTORIA" BREAD SLICER.

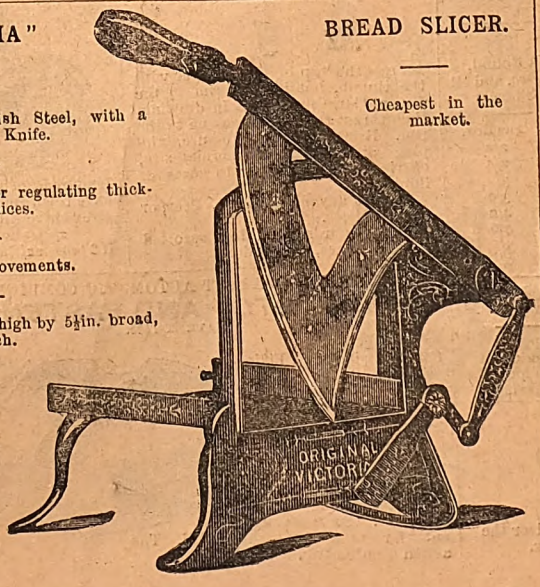
Made of first-class Swedish Steel, with a Pointed Edge Knife.

Fitted with Adjuster, for regulating thicknesses of slices.

All recent improvements.

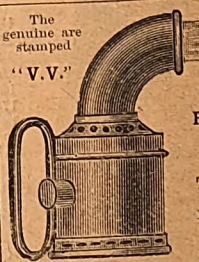
No. 1, for Loaves, 6in. high by 5½in. broad, 7/11 each.

No. 2,
8in. high by 7½in. broad,
10/6 each.



Cheapest in the market.

The genuine are stamped "V.V."



Sole Agents for the
PATENT "PAQUELIN" PAINT-REMOVING LAMP.

Thousands have been sold.

They save their cost in a week

It is simple and most effectual.
It can be used in any position.
It gives over 1,000 degrees of heat.
It costs to work 1d. for four hours.
Its action is automatic.
No pumping is required.

Use Benzoline only.

12/ each.

Discount, 15 per cent. If 12, 20 per cent.

It is invaluable for Paint Removing, Soldering, Heating Metal Pots, Soldering Irons and Laundry Irons, Joint Making, Removing Old Oils from Machines, Tempering Tools, Fusing Metals, Lead Burning, Pipe Thawing, and all Plumbers' work.

Directions for use sent with each Lamp.

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"FAIRY," "FAIRY-PYRAMID" AND "PYRAMID" PRICE LIST.

Registered Trade Mark, "FAIRY—PYRAMID."

Trade Mark, "FAIRY."

CRICKLEWOOD STATION,
MIDLAND RAILWAY.

Trade Mark, "PYRAMID."

Telegrams—
"PYRAMID," LONDON.

DEPOTS—READE STREET, NEW YORK;
" 484, COLLINS STREET MELBOURNE.

CLARKE'S "PYRAMID" & "FAIRY" LIGHT

COMPANY, LIMITED,

CRICKLEWOOD, LONDON, N.W.

September 1, 1890.

GENTLEMEN,

In sending the enclosed Price List of New Goods, we wish to call your special attention to the **NEW SHADES**—quite novel and very beautiful. The ANTIQUE LAMP, we think, will have a large sale. Also the new LANTERN, for burning "Fairy-Pyramid" Lights.

Soliciting the honour of a visit to our Show Room, 31, ELY PLACE, E.C.,

We are, Gentlemen,

Yours obediently,

CLARKE'S "PYRAMID" & "FAIRY" LIGHT CO., LIMITED,
LONDON, N.W.,
and 484, COLLINS STREET, MELBOURNE.

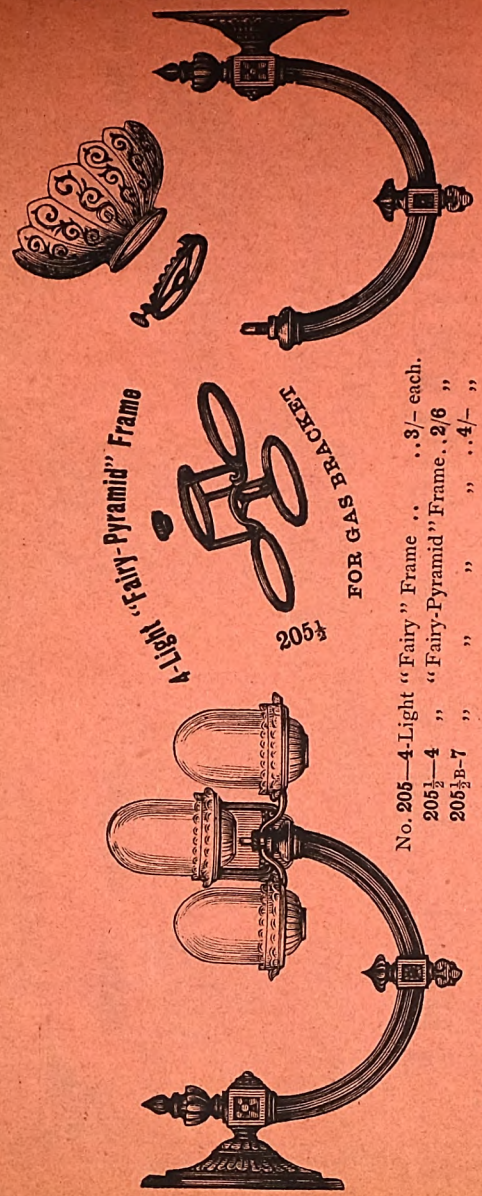
PATTERN BOOKS

Price **2/6**, of over **300** Coloured Designs of "FAIRY" LAMPS, &c.
COLOURED SHEETS OF NEW PATTERNS SENT ON APPLICATION.

Digitized by Google

PATENT "FAIRY-PYRAMID" LAMPS,

TRADE MARK "FAIRY-PYRAMID" STAMPED ON EVERY LAMP.



No. 205—4-Light "Fairy" Frame .. ..3/- each.
205½—4 " "Fairy-Pyramid" Frame..2/6 "
205½B-7 " " " ..4/- "

SHOWING how to transform Gaseliers, Wall Brackets, Gas Standards, etc., temporarily or permanently into Clarke's "FAIRY-PYRAMID" LAMPS without disturbing the gas arrangement.

Five minutes time is sufficient to alter each branch; for example, see the engraving of an ordinary Gas Bracket.

Take off the Shade and the Shade Gallery, then slip on the Four-light Frame, screwing it down with the nut sent therewith. When the lamps are in, the effect will be as engraved, a Four-light "Fairy-Pyramid" Wall Bracket.

PATENT "FAIRY" LAMPS,
TRADE MARK "FAIRY" STAMPED ON EVERY LAMP.

This figure shows a Three-light Gaselier, in the process of being changed in this way into a beautiful 12-light "Fairy" Chandelier.

N.B.—The cost of the Four-light holder is very small. THE BURMESE, OR CUT LAMPS, ARE BEST FOR CHANDELIERS OR BRACKETS.

See Price List, furnished on application.

"FAIRY LAMPS."

New Designs in Tapestry Ware,

WITH DECORATED BURMESE SHADES.

SEE COLOURED SHEET.

		PER DOZ.			PER DOZ.
No. 235—Complete	..	96/-	No. 242—Complete	..	96/-
236— "	..	96/-	243— "	..	96/-
237— "	..	118/-	244— "	..	96/-
238— "	..	142/-	245— "	..	158/-
239— "	..	158/-	246— "	..	142/-
240— "	..	158/-	247— "	..	142/-
241— "	..	142/-	248— "	..	142/-

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HER MAJESTY
THE QUEEN.

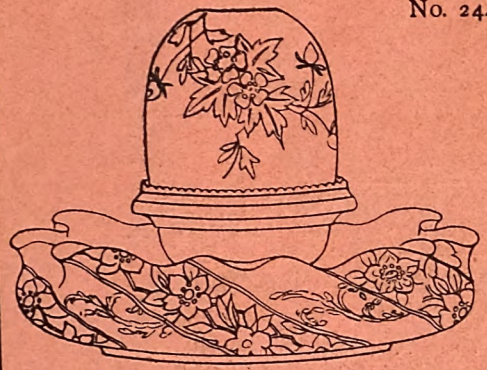
No. 242.

No. 243.

Regd. Trade Mark.
"FAIRY"

No. 244.

Regd. Trade Mark
"FAIRY"



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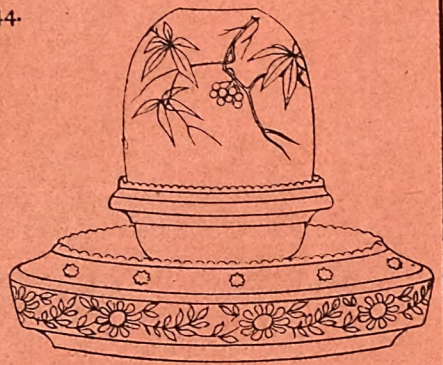
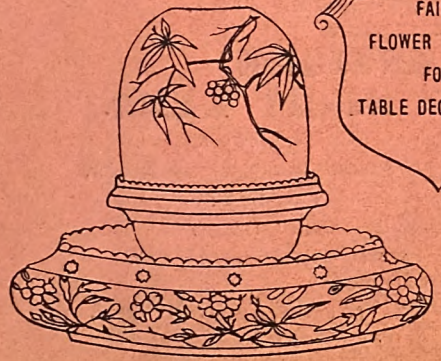
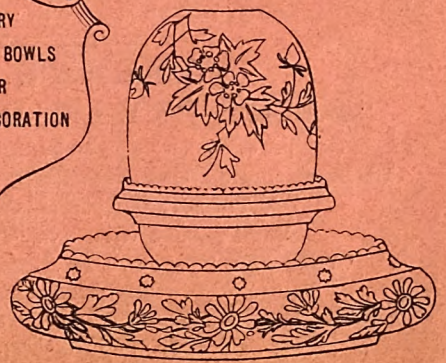


No. 246.



No. 247.

FAIRY
FLOWER BOWLS
FOR
TABLE DECORATION



No. 248.

HER MAJESTY
THE QUEEN.

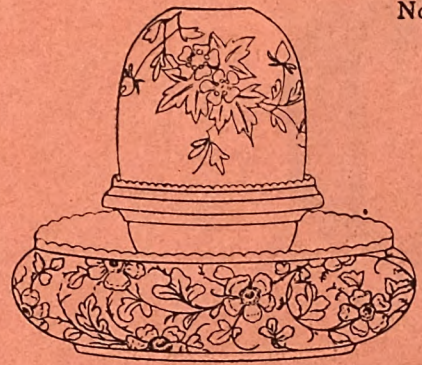
No. 235

No. 236.

Regd. Trade Mark.
"FAIRY"

No. 237.

Regd. Trade Mark.
"FAIRY"



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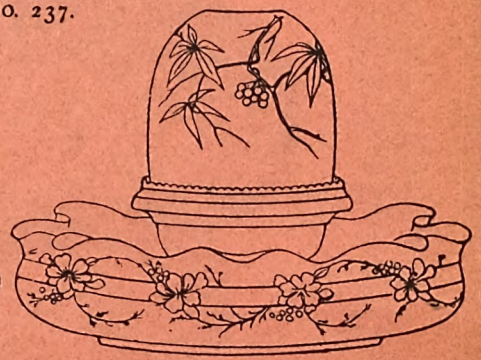

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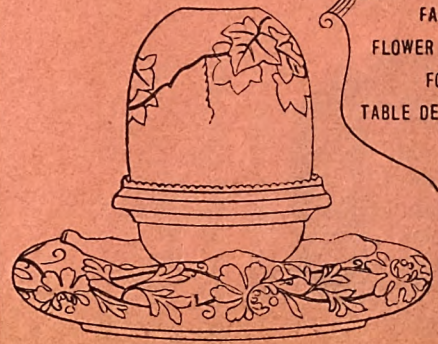

No. 240.

FAIRY
FLOWER BOWLS
FOR
TABLE DECORATION

No. 241.

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1889 "FAIRY" LAMP, with Corrugated, Mottled or Zebra SHADES, and Colours.

Loose, 8/- per dozen.

If Boxed with "Fairy" Light, 10/- per dozen.

1889 "FAIRY" LAMP, with SATIN SHADES, Rose and Blue.

Loose, **10/6** doz.

If Boxed with "Fairy" Light, **12/6** doz.

The **1889** "Fairy" Lamp. Assorted, in Five Colours.

5/- doz.

Packed in Box with One "Fairy" Light, 7/- doz.

Ruby Shades, 4/- doz. extra.

"WEE-FAIRY" LAMPS, AND FOR BURNING Clarke's "Fairy-Pyramid" or "Pyramid" Lights,

SEE COLOURED SHEET.

No.		Per Doz.	EXTRA SHADES, Per Doz.
321—Complete	.. .. ..	8/-	2/6
322 "	"Wee Fairy" .. *Cigar Lamps*	15/-	3/6
323 "	" "	12/-	3/6
324 "	"Fairy-Pyramid"	18/6	3/6
325 "	" "	96/-	3/6
326 "	" "	54/-	17/-
327 "	" "	72/-	3/6
328 "	" "	78/-	3/6
329 "	" "	126/-	..
330 "	" "	210/-	4/6
331½ "	"Fairy" size	15/- each	4/6
331 "	" "	21/- "	9/-
332 "	"Fairy-Pyramid"	6/6 "	2/6
333 "	"	7/6 "	3/6
334 "	"	4/6 "	3/6
336 "	"	2/6 "	3/6
			RUBY EXTRA.
335½ "	"	16/6 "	2/-
335 "	"Fairy" size	21/6 "	3/-

PATTERN BOOKS

Price 2/6, of over 300 Coloured Designs of "FAIRY" LAMPS, &c.

Clarke's "Fairy-Pyramid" Lantern.

Registered No. 137,929.

Decorated Tin	16/-	per dozen.
Copper	20/-	"

SHADES—VARIOUS COLOURS; Ruby 4/- doz. extra.

EACH PACKED WITH ONE "FAIRY-PYRAMID" LIGHT.

*CLARKE'S ANTIQUE "FAIRY-PYRAMID" NIGHT LAMP.

30/- per dozen, including Metal Screen. Registered No. 145,668.

The Figure is of obscured glass; the light underneath illuminates the interior, and makes a very pleasant and charming Night-Light.

EACH PACKED WITH ONE "FAIRY-PYRAMID" LIGHT.

**N.B.—This Lamp will be largely advertised at 5/- each retail.*

CLARKE'S "PYRAMID" & "FAIRY" LIGHT Co. LIMITED,

LONDON, N.W.

SHOW ROOM—31, ELY PLACE, E.C.,

AND 484, COLLINS STREET, MELBOURNE.

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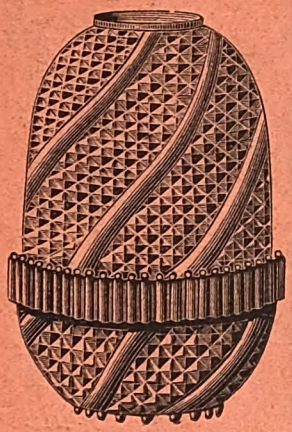
LARKE'S "FAIRY-PYRAMID" LAMPS,

IN CRYSTAL AND VARIOUS COLOURED GLASS.

No. 1890.

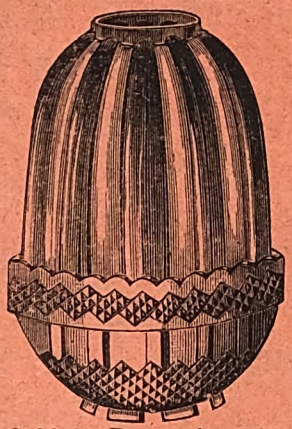
in Box only, with One Light, 3/- doz.

No. 223½B.



Sold in Box only, with One Light, 3/- doz.

No. 223½. BLUE PEARLINE.



Sold in Box only, with One Light, 4/- doz.

No. 223A.

WITH CHAIN AND BRACKET. Sold in Box, with One Light, 6/- per doz.; without Chains, 2/6 per doz.

Registered Trade Mark, "Fairy-Pyramid."

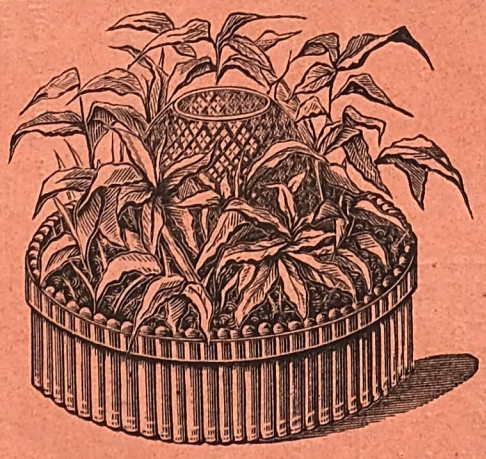
IGNED FOR BURNING CLARKE'S "PYRAMID" OR "FAIRY-PYRAMID" LIGHTS

8 LIGHTS IN A BOX. PRICE 7/6 PER DOZEN BOXES. BURN 9 HOURS.

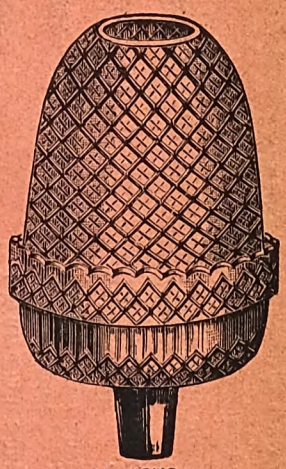
CLARKE'S "FAIRY-PYRAMID" LAMPS.

IN CRYSTAL AND VARIOUS COLOURED GLASS.

No. 222.—With Plush Stand, d in Box, with One Light, 8/- doz.



No. 272. Sold in Box, with One Light, 8/- doz.



No. 273. 3/6 packed in separate box with One "Pyramid" Light included in each Lamp.

REGISTERED TRADE MARK, "FAIRY-PYRAMID."

ESIGNED FOR BURNING CLARKE'S "PYRAMID" OR "FAIRY-PYRAMID" LIGHTS,

8 LIGHTS IN A BOX. PRICE 7/6 PER DOZEN BOXES. BURN 9 HOURS EACH.

"Fairy" Menu Cards, 6/- per gross; Retail price, 1/- per dozen.

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FAIRY-PYRAMID LAMPS

Registered Trade Mark, "FAIRY-PYRAMID."

No. 213—Green	with Bright Coloured Shades, Flint bottoms,	
214—Citron		3/- per dozen complete.
215—Ruby	" " "	5/- " "
216—		
218—	Obscured Coloured Shades, Flint bottoms,	7/- per doz.
220—		
221—		
217, 219—Ruby	" " "	8/- "
223½—Blue Pearline	*In Boxes only with*	4/- "
223½B—" " "	*One "Pyramid" Light*	3/- "
223A— " " "	with Chains	6/- "
222—Plush Stands, with Lamp	.. ..	8/- "

All the above in Boxes only, with One "Pyramid" Light.

NEW LAMPS.

The "FAIRY-PYRAMID"

For Burning "Pyramid" Lights.

HALF THE PRICE OF "FAIRY" LIGHTS.

(*See Coloured Diagrams.*)

REGISTERED TRADE MARK, "FAIRY-PYRAMID."

No. 224—In Bright Colours, and Obscured	..	20/-	per dozen.		
225— " "	..	22/-	"		
*226— " "	..	27/-	for Menu,		30/-
*228— " Blue	..	27/-	" "		30/-
*228— " Ruby	..	31/-	" "		34/-
227—Obscured, *Verre moire*	..	22/-			
*229— " "	..	29/-	" "		32/-
230— " "	..	22/-			
*231— " "	..	33/-	" "		36/-

"FAIRY" Menu Cards, 6/- per gross; Retail price, 1/- per dozen.

* *These patterns are also made to hold Menu Cards, 3/- per dozen extra, Card included.*

N.B.—A "FAIRY" Menu Card will be supplied gratis with every "FAIRY" Lamp of a higher price than 12/- per dozen—to be given to the purchaser of the Lamp.

The Menu Lamp complete, shown in the February number of the *Pottery Gazette*, is No. 229 in Price List, 29/- per dozen; the Shade drawn is wrong, it should be *Verre moire*, to match the Bowl.

FAIRY-PYRAMID SHADES ONLY.

No. 223½—	1/6	per dozen.
213 & 214	1/6	"
215—Ruby	3/6	"
216 & 218—	5/-	"
217 & 219—Ruby	7/-	"
220 & 221—	5/-	"
224—Bright Threaded	6/-	"
225—Ruby	8/-	"
229, 230 & 231—*Verre moire*	7/-	"
Plain Burmese	7/-	"
Decorated	17/-	"
Rose Opal—Cut	16/-	"
Cameo	24/-	"
Blue Pearline	2/6	"

"FAIRY-PYRAMID" LAMPS

IN PATENT BURMESE GLASS,

WITH MENU HOLDERS.

(NEW PATENT.)

REGISTERED TRADE MARK, "FAIRY-PYRAMID."

See Illustration.

No. 250—	Decorated, .. 43/-	Plain, ... 33/-	per dozen.
251—	Decorated, .. 43/-	With Plain Shade, 33/-	"
252—	Decorated, .. 43/-	With Plain Shade, 33/-	"
253—	Decorated, .. 43/-	With Plain Shade, 33/-	"
254—	Decorated, .. 46/-	With Plain Shade, 36/-	"
255—	Decorated, .. 46/-	With Plain Shade, 36/-	"
256—	Decorated, .. 76/-	With Plain Shade, 66/-	"

Complete, including Menu Card.

N.B.—Extra Cards, 6/- per Gross.

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No. 257—	9/-	per dozen.
258—	9/-	,,
259—	7/-	,,
260—	9/-	,,
261—	17/6	,,
262—	36/-	,,
263—	13/-	,,
264—	13/-	,,
265—	101/-	,,
266—	36/-	,,
267—	66/-	,,
268—	52/-	,,
269—	66/-	,,
270—	13/-	each.
271—	69/-	per dozen.

FLINT GLASS.

No. 272—Flower Circle	*Packed in separate box, with a 9 hour "Pyramid" Light included.*	8/- per dozen.
273—With Peg		3/6 ,,
223½—Blue Pearline		4/- ,,
223½—Lamp, with 9 "Pyramid" Lights to burn 9 hours, packed in a box ..		10/- per dozen boxes.

CLARKE'S "FAIRY-PYRAMID" LAMPS, IN TAPESTRY WARE,

AS PURCHASED BY HER MAJESTY THE QUEEN.

No. 274—As drawn	5/-	each; if with menu and holder ..		6/3
275— ,,	3/2	,, ,, ,, ..		4/5
276— ,,	5/-	,, ,, ,, ..		6/3
277— ,,	13/1	,, ,, ,, ..		13/1
278— ,,	5/-	,, ,, ,, ..		6/3
279— ,,	14/2	,, ,, ,, ..		14/2
280— ,,	15/6	,, ,, ,, ..		15/6
281— ,,	3/8	,, if with decorated shades ..		4/6
282— ,,	4/9	,, ,, ,, ..		4/9
283— With Plush Stand.	2/-	,, ,, ,, ..		3/1
284—As drawn	11/5	,, ,, ,, ..		11/5
285— ,,	11d.	,, ,, ,, ..		1/9
286— ,,	10/-	,, ,, ,, ..		10/10
287— ,,	11/1	,, ,, ,, ..		11/1

CLARKE'S "FAIRY-PYRAMID" LAMPS, IN ORMOLU.

No. 288—	24/-	dozen.
289—	7/-	,,
290—Stoneware, with decorated Burmese Shade	84/-	,,
291—Ormolu	27/-	,,
292—	27/-	,,
293—	36/-	,,
319½—Oval Centre, 3 Lamps and 2 Flower tubes	120/-	,,

SOLD IN BOX ONLY, WITH ONE "PYRAMID" LIGHT INCLUDED.

A MARVEL OF CHEAPNESS.

No. 223½—Old Pattern Diamond Shade	2/6	doz.
223½—With Blue Pearline Pillared Shade	4/-	,,
223½B—Assorted Colours	3/-	,,
223½—With Rose and Yellow Mottled Shades ..	4/6	,,
223½—Jewelled, Various Colours	3/6	,,
223½ C & D—Rose and Blue Dotted	3/6	,,
1890—New Pattern	3/-	,,
223½—Rose and Blue Satin	5/6	,,
215—Ruby	5/-	,,

No. 294—Pink ..	12/-	doz.	No. 296—Blue	12/- doz. (Boxed complete with One Light.)
295—Citron ..	12/-	,,	"Fairy" size ..	21/- ,, (Boxed complete with One Light.)

"FAIRY-PYRAMID" Tapestry Ware.

No. 238½—	96/-	doz.	No. 245½—	106/-	doz.
239½—	106/-	,,	246½—	96/-	,,
240½—	106/-	,,	247½—	96/-	,,
241½—	96/-	,,	248½—	96/-	,,

Same patterns as in "FAIRY" size.

"FAIRY-PYRAMID" LAMPS, IN PATENT QUEEN'S BURMESE WARE.

No. 177½—"Fairy-Pyramid"	2-light Sociable ..		10/-	each.
178½— ,,	3 ,, ,, ..		13/6	,,
194½— ,,	4 ,, Centre ..		20/-	,,
195½— ,,	2 ,, ,, ..		18/6	,,

Designs same as the "FAIRY" Lamp size.

CLARKE'S "WEE-FAIRY" LAMPS

(*Same size as "Fairy-Pyramids"*).

COMPLETE with Inner Glass; FLINT, BLUE, GREEN, PUCE, or AMBER Shades; in BOXES, with **ELEVEN** "Wee-Fairy" Lights, burn about 4 hours each .. .. **7/6** per dozen boxes.

Ditto with One Light only .. .. **3/-** ,, ,,

PORCELAIN FLOWER SHADES for the above— **CACTUS, CARNATION** (Single and Double), and **WATER LILY**, each in 3 colours .. .. **12/-** per dozen.

"WEE-FAIRY" FLOWER CIRCLES in Flint, Shades various colours, in BOXES, with One "Wee-Fairy" Light .. .. .. **7/-** per dozen.

"WEE-FAIRY" LIGHTS, Eleven in a Box, with Glass, burn about 4 hours, **4/6** per doz. RUBY SHADES, **2/-** per dozen extra.

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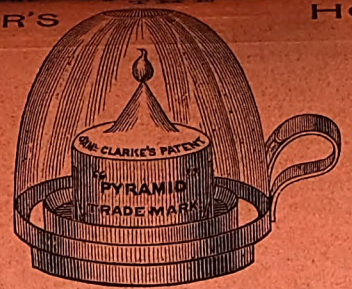
BURGLAR'S HORROR.

PATENT

"Pyramid"

Night Lamps,

6/- dozen.



PATENT

"Pyramid"

Night Lights,

7/6 doz. Boxes.

The "PYRAMID" NIGHT LAMPS render the burning a Night Light perfectly safe, entirely prevent FLICKERING (so objectionable in all Night Lights not burned in a lamp), are clean, portable, and render a Night Light useful for many purposes where they otherwise would not be.

The "PYRAMID" FOOD WARMERS, by their peculiar construction—the glass chimney conducting and concentrating heat to the bottom of the water vessel—a larger amount of LIGHT and HEAT is obtained than can be had in any other lamp of the same class. Without SMOKE or SMELL.

The "PYRAMID" NIGHT LIGHTS have a patent prepared wick, are made much larger than any other Night Light, and give double the light; they are, therefore, very suitable for nursery lamps, lighting passages, lobbies, &c., and adaptable to many purposes for which the common Night Lights are useless.

Directions for using the Patent "Pyramid" Food Warmer & Night Lights.

The food which is required to be kept hot to be placed in the porcelain pannikin, and water in the tin vessel—just sufficient to admit the porcelain pannikin being placed therein. Care should be taken in lighting the Night Lights not to injure the top, which is a protection for the wick, but simply apply a lighted match or taper and allow the material to melt away.

NEW PATTERN, including BRASS "PYRAMID" LAMP, and REGISTERED PANNIKIN.

	RETAIL.	WHOLESALE.
No. 1 Holds Half-pint Food, besides Water,	Price 3s. 6d. each	30s. per doz.
No. 2 ,, Three-quarters Pint Food ,,	,, 5s. 0d. ,, ...	33s. ,,
No. 3 ,, One Pint Food ,,	,, 6s. 0d. ,, ...	36s. ,,
Clarke's No. 1888 Lamp, with Porcelain and Tin Pannikin	,, 2s. 6d. ,, ...	20s. ,,
,, ,, with Tin Pannikin only	,, 1s. 6d. ,, ...	12s. ,,
,, Pyramid Night Lamps	,, 1s. 0d. ,, ...	6s. ,,
,, ,, ,, Lights	7s. 6d. per dozen Boxes, 8 Lights in a Box.	

CAUTION—The Patentee, in reply to numerous consumers, begs to state that he will warrant his PATENT "PYRAMID" FOOD WARMERS to answer the purpose for which they are recommended, only when the "Pyramid" Night Lights are burned in them; the common night lights will not give sufficient heat. Persons who find a difficulty in obtaining the "Pyramid" Night Lights in good condition, are requested to write to the Patentee, S. CLARKE, Patent "Pyramid" Night Light Works, Cricklewood, London, N.W., who will give the address of his nearest agent. The "Pyramid" Night Lights are best when newly made; the "Pyramid" Food Warmers are sold by all respectable dealers throughout the Kingdom.

N.B.—Extras.—Porcelain Pannikins, No. 1 ... 6s. ... Lids, ... 2s. per dozen.
No. 2 ... 8s. ... ,, ... 2s. ,,
No. 3 ... 9s. ... ,, ... 3s. ,,
Tin Pannikins No. 1, 8s. ... No. 2, 10s. ... No. 3, 12s. per dozen.
Clear Glasses, 4s. ... Roughed, 6s. ... Opaline, 6s. ... Coloured, 6s. ... Ruby, 8s. per doz.

Clarke's "Pyramid" and "Fairy" Light Company, Limited,
CRICKLEWOOD, LONDON, N.W.

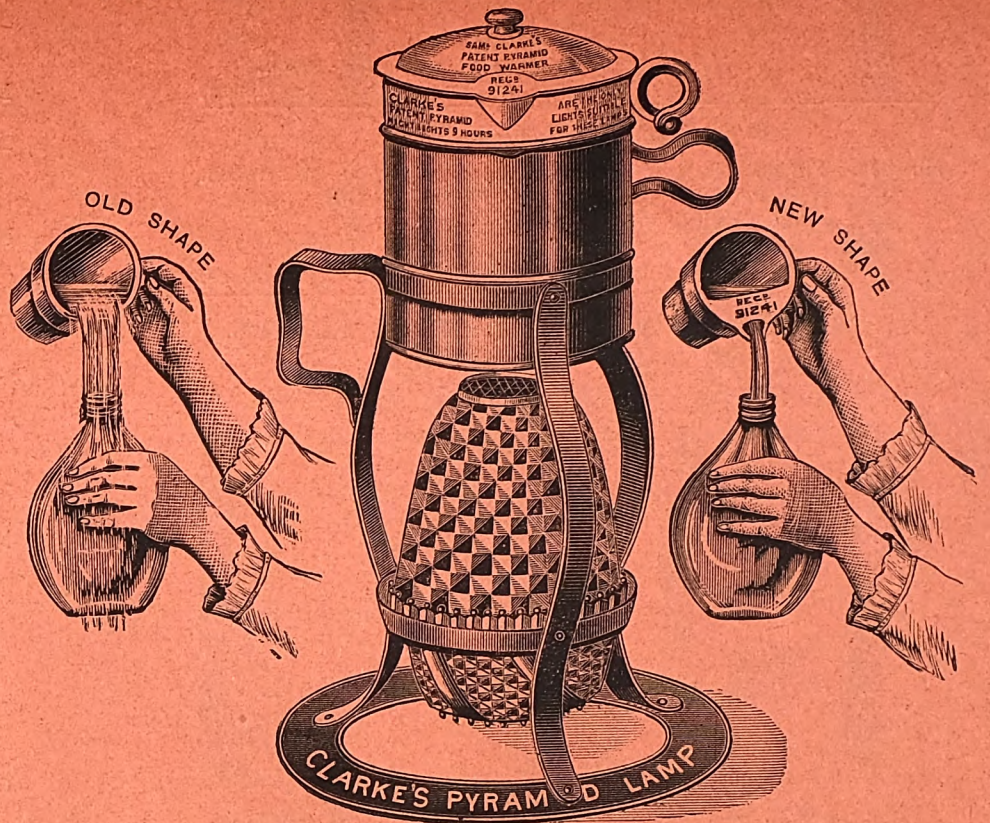
SAMUEL CLARKE'S
IMPROVED PANNIKINS (REGISTERED)
FOR USE WITH
CLARKE'S CHEAP PYRAMID "NURSERY" LAMP.

By this invention any liquid ood can be poured out, or drunk, without scum or grease passing through the spout, and prevents spilling when poured into a Feeding Bottle, so unavoidable with all other Pannikins.

These Pannikins will fit all the old "Pyramid" Nursery Lamps, and can be purchased separately.

N.B.—Ask for CLARKE'S PANNIKIN, and see that his name and the registered number (Registered 91,241) is on the Pannikin, and trade mark "PYRAMID."

Clarke's Patent "PYRAMID" NIGHT LIGHTS are the only Lights suitable for these Lamps.



1888 "PYRAMID" NURSERY LAMP.

PRICES.

Complete with Registered Porcelain and Tin Pannikin .. .. 20/- per dozen.

Extra Registered Porcelain Pannikins—
No. 1, 6/- per doz. .. No. 2, 8/- per doz. .. No. 3, 9/- per doz.

Complete with Tin Pannikin only.. .. .. 12/- per dozen.

Extra Porcelain Lids—
No. 1, 2/- per doz. .. No. 2, 2/- per doz. .. No. 3, 3/- per doz.

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CLARKE'S PATENT "FAIRY" MENU LAMPS.

No. **256**, in Queen's Burmese Ware
228 in Verre Moire, Pink,
Blue & Citron.

N.B.—These designs are now largely advertised.

No. 256 "FAIRY-PYRAMID" SIZE.
PLAIN BURMESE, 66s., DECORATED, 79s. per dozen.

No. 228 "FAIRY-PYRAMID" SIZE, RUBY, 31s. doz.
No. 234 "FAIRY" SIZE, VERRE MOIRE, 41s.; RUBY, 44s. doz

ARKE'S PATENT "PYRAMID" LIGHTS, burn **9** hours. **7/6** per dozen, **8** Lights in Box.

THE ONLY PERFECT NIGHT LIGHT.

CLARKE'S "FAIRY-PYRAMID" LAMP,

WITH **NINE** "PYRAMID" LIGHTS,

COMPLETE IN A BOX.

Wholesale, **10/-** per dozen.

THIS IS CALLED "THE TRAVELLER'S FRIEND."

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Clarke's Newly Designed "Pyramid" Nursery Lamp Food Warmer, with New Registered Pan

CAUTION.—All Night Lights made of Paraffin, if burnt in a Lamp, become very **hot**; the material is liable to **take fire**, and is very **dangerous**.

N.B.—NO ALTERATION IN THE PRICE OF THE OLD PATTERN "PYRAMID" FOOD WARMER

Clarke's Improved "Pyramid" Food Warmer, including Brass "Pyramid" Lamp, } No. 1, ½ Pint, 30/- doz.
" " " " " 2, ¾ " 33/- "
" " " " " 3, 1 " 36/- "

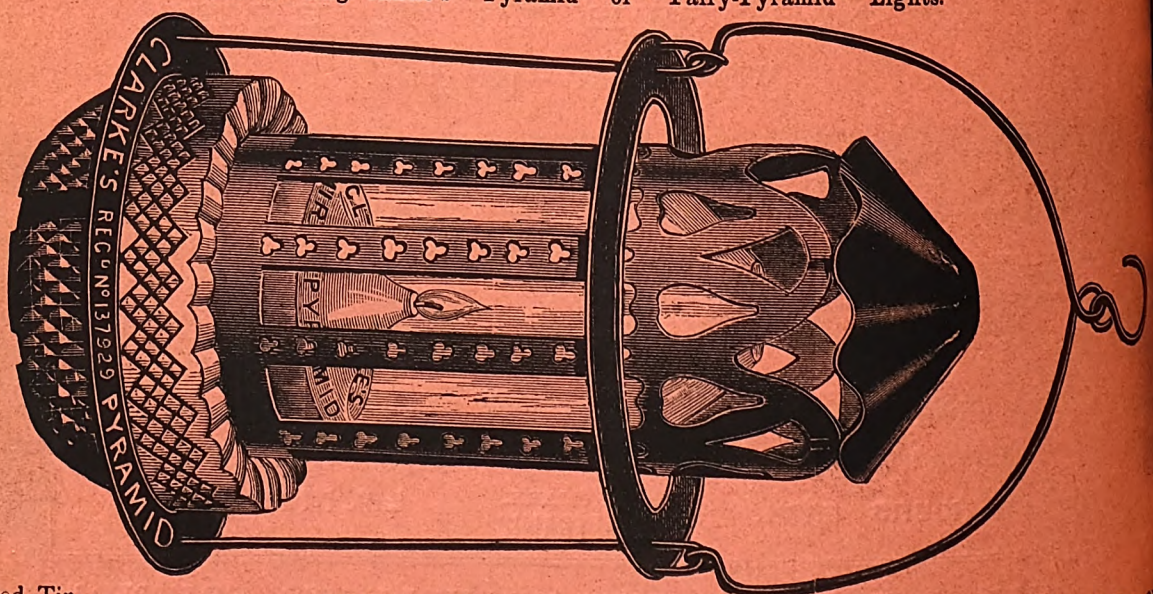
ALL WITH NEW REGISTERED PANNIKINS.

Extra Pannikins, 6/-, 8/- & 9/-; Lids, 2/-, 2/- & 3/- per doz.

CLARKE'S NEW "FAIRY-PYRAMID" LANTERN

For Burning Clarke's "Pyramid" or "Fairy-Pyramid" Lights.

Weather Proof.



Decorated Tin .. .. .. per dozen 16/-
Copper .. .. " 20/-
Each packed with one "Fairy-Pyramid" Light.

SHADES OF ALL COLOURS; Ruby 4/- doz. extra

DIAMOND PATTERN.

"FAIRY-PYRAMID"

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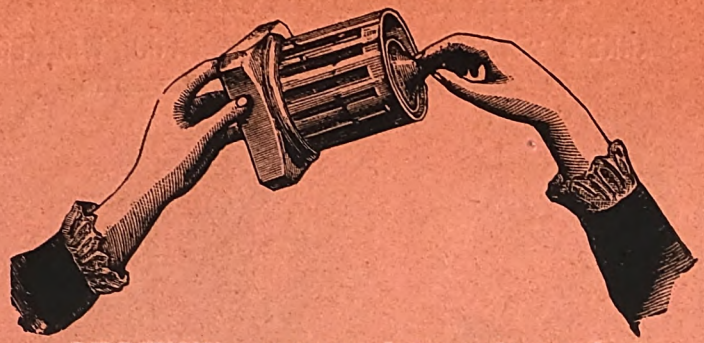
CLARKE'S "FAIRY-PYRAMID" LIGHTS.



DIRECTIONS—FOR PLACING LIGHT IN ANTIQUE LAMP.

Hold the Glass Pillar sideways, and gently slide the Light in.

N.B.—Remove the remains of last burnt light before placing a fresh one.

CLARKE'S "PYRAMID" NIGHT LIGHTS,

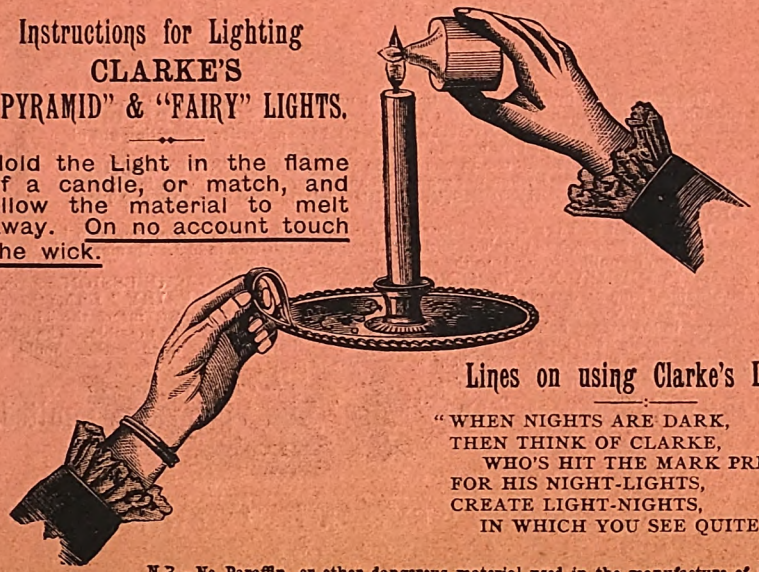
THE

BURGLAR'S HORROR,

8 LIGHTS IN A BOX, BURN 9 HOURS, 7/6 PER DOZ.

Instructions for Lighting CLARKE'S "PYRAMID" & "FAIRY" LIGHTS.

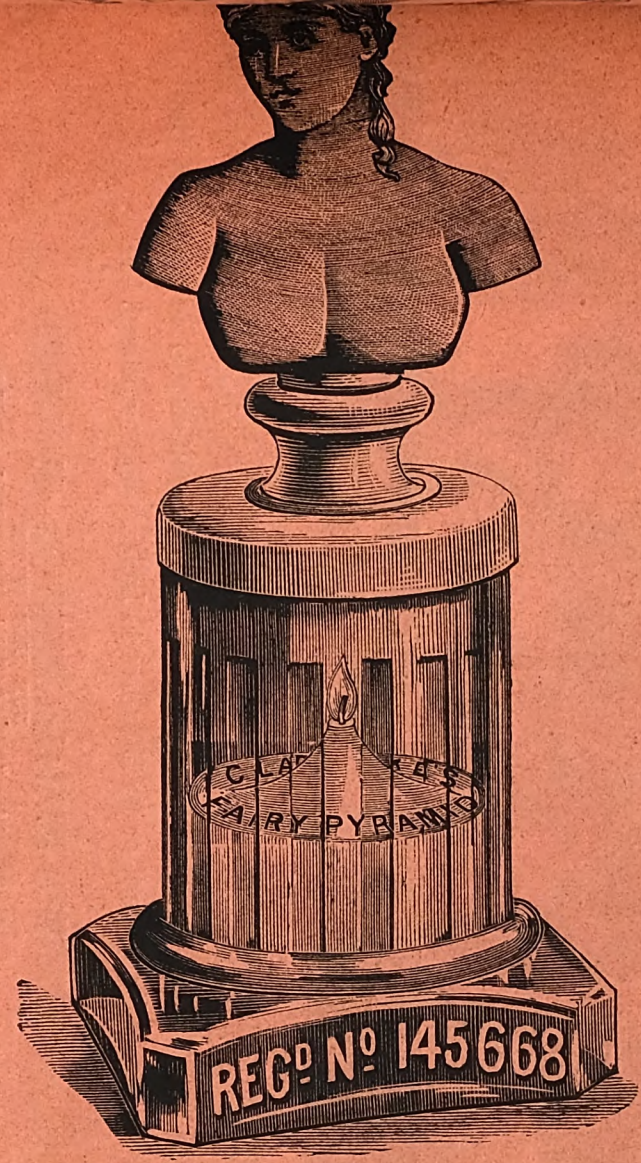
Hold the Light in the flame of a candle, or match, and allow the material to melt away. On no account touch the wick.



Lines on using Clarke's Lights.

"WHEN NIGHTS ARE DARK,
THEN THINK OF CLARKE,
WHO'S HIT THE MARK PRECISELY;
FOR HIS NIGHT-LIGHTS,
CREATE LIGHT-NIGHTS,
IN WHICH YOU SEE QUITE NICELY.'
—W.E.

N.B.—No Paraffin, or other dangerous material used in the manufacture of these Lights.



CLARKE'S ANTIQUE "FAIRY-PYRAMID" NIGHT LAMP.

PRICE ... ... 30s. PER DOZEN, WITH METAL SCREEN.

FOR BURNING

CLARKE'S "FAIRY-PYRAMID" LIGHTS.

The Figure is of obscured glass; the light underneath illuminates the interior, and makes a very pleasant and charming Night-Light.

Each packed with one "Fairy-Pyramid" Light.

N.B.—This Lamp will be largely Advertised at 5/- each.

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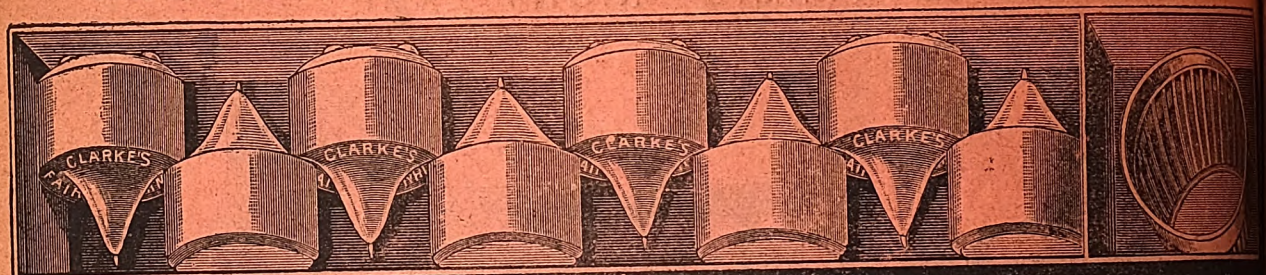
Clarke's "Fairy" Lights, "Fairy-Pyramid" and "Pyramid" Lights are all suitable for EXPORT, and no Paraffin or other dangerous material is used in the manufacture.



CLARKE'S "FAIRY-PYRAMID"-LIGHTS.

SINGLE WICKS BURN 10 HOURS.
8 LIGHTS AND GLASS IN BOX,
7/- PER DOZEN BOXES.

DOUBLE WICKS BURN 6 HOURS.
8 LIGHTS AND GLASS IN BOX,
7/6 PER DOZEN BOXES.

Orders for one Gross Boxes, sent Carriage Paid in a Free Case to any Railway Station in England, or by Steamer to Ireland and Scotland.

CLARKE'S IMPROVED PANNIKINS (REGISTERED)
FOR USE WITH
CLARKE'S "PYRAMID" NURSERY LAMP.

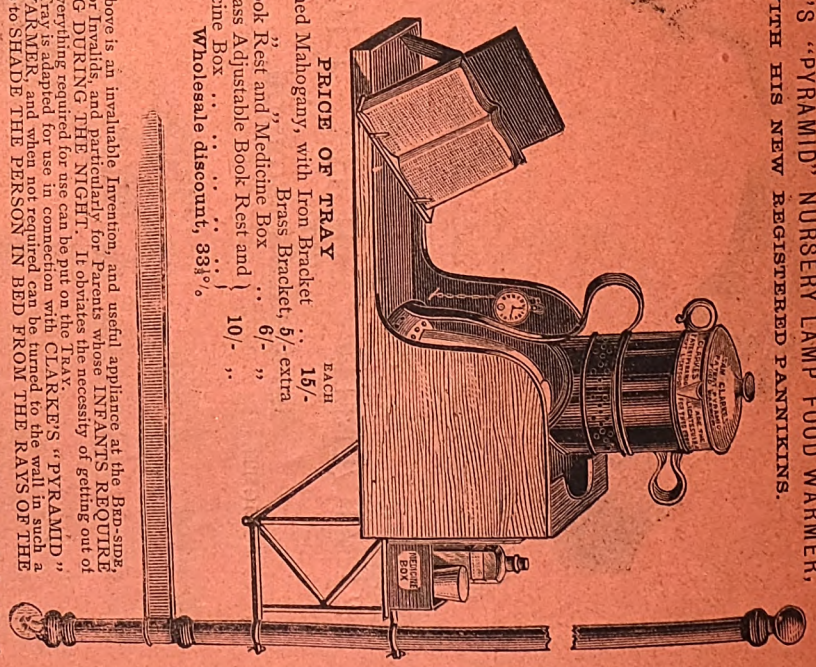
By this invention any liquid food can be poured out, or drunk, without scum or grease passing through the spout, and prevents spilling when poured into a Feeding Bottle, so objectionable with all other Pannikins.

These Pannikins will fit all the old "Pyramid" Nursery Lamps, and can be purchased separately.

N.B.—Ask for CLARKE'S PANNIKIN, and see that his name and the registered number (Registered 91,241) is on the Pannikin, and trade mark "PYRAMID."

Clarke's Patent "PYRAMID" NIGHT LIGHTS are the only lights suitable for these Lamps.

CLARKE'S ADJUSTABLE BED-TRAY,
(PROTECTED BY TWO PATENTS.)
FOR INFANTS AND INVALIDS, for use with
CLARKE'S "PYRAMID" NURSERY LAMP FOOD WARMER,
WITH HIS NEW REGISTERED PANNIKINS.



PRICE OF TRAY EACH

In Polished Mahogany, with Iron Bracket .. 15/-
With Book Rest and Brass Bracket, .. 5/- extra
With Brass Adjustable Book Rest and Medicine Box .. .. .. 6/- ,,
Wholesale discount, 33⅓%

The above is an invaluable Invention, and useful appliance at the BED-SIDE, suitable for Invalids, and particularly for Parents whose INFANTS REQUIRE FEEDING DURING THE NIGHT. It obviates the necessity of getting out of bed, as everything required for use can be put on the TRAY.

The Tray is adapted for use in connection with CLARKE'S "PYRAMID" FOOD WARMER, and when not required can be turned to the wall in such a manner as to SHADE THE PERSON IN BED FROM THE RAYS OF THE LIGHT.

Invalids will find it a GREAT COMFORT, for any book, plate, basin, &c., can be placed thereon ready for use, and obtained without altering the position in bed. By means of a Slide, the tray can be pulled forward to the position or length required.

IT IS HIGHLY RECOMMENDED BY THE MEDICAL PROFESSION, and can be obtained from all dealers in CLARKE'S "PYRAMID" and "FAIRY" LAMPS.

DIRECTIONS FOR FIXING.—Place the Clips round the bed-post, insert the Thumb-screw in the square hole at the end of same, and screw as tightly as possible. The Clips being of spring steel, they will fit any size post. A little cloth or wash-leather should be placed round the bed-post to prevent scratching the post.

If any difficulty is experienced in procuring them in any town, please write to

Clarke's "Pyramid" and "Fairy" Light Company, Limited,
CRICKLEWOOD, LONDON, N.W.
Who will give the Address of the nearest Agent.

CLARKE'S "PYRAMID" LIGHTS.

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ARKE'S "WEE-FAIRY" LAMP & "WEE-FAIRY" LIGHTS,

PATENT.

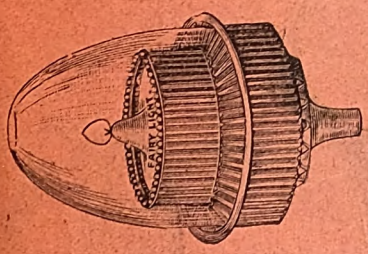
VEE-FAIRY" LAMP.

Sold in Box, with One Light, 3/- dozen.

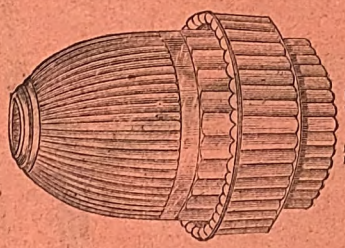
price as "Fairy-Pyramid" Lamp.

GLASS AND 11 LIGHTS IN A BOX, BURN ABOUT 4 HOURS EACH, 4/6 PER DOZEN BOXES.

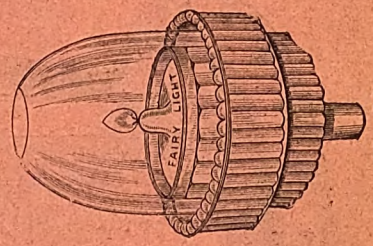
N.B.—The "Wee-Fairy" Lights can be burned in any "Fairy-Pyramid" Lamp.



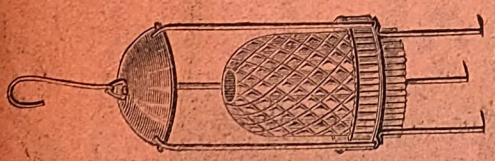
No. 11—For Candelabra Mirrors, &c. 5/6 dozen, without Shades.



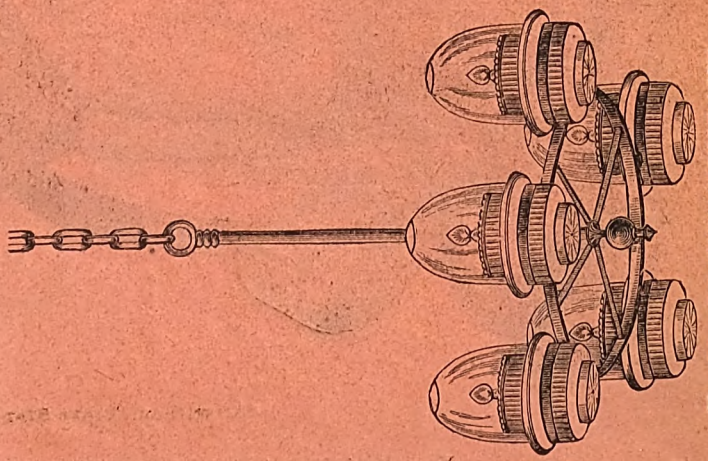
No. 15. No. 15—5/6 dozen, without Shades.



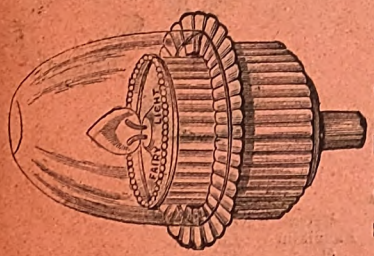
No. 16. No. 16—5/6 dozen, without Shades



No. 8—"Fairy" Garden Lamp. 12/- dozen, complete.



No. 20.—5-LIGHT PENDANT. No. 20—6/10 each, without Shades.



No. 14—With Peg, for Candelabra, &c. 5/6 dozen, without Shades.

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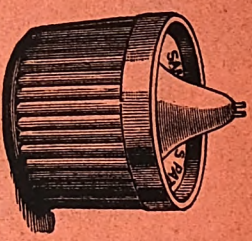
Clarke's Patent Lights
FOR ALL CLIMATES.
FAR, FAR AND AWAY THE BEST.

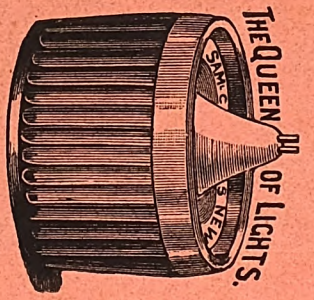
NO PARAFFIN OR OTHER DANGEROUS MATERIAL USED IN THE MANUFACTURE.

7/6 per dozen Boxes.
In Fireproof Plaster Casing.

*"PYRAMID" LIGHT.
Single Wicks, burn 9 hours each.
In Boxes containing 8 Lights.



*"FAIRY-PYRAMID" LIGHT
7/6 per dozen Boxes.
With DOUBLE WICKS, burn 6 hours each. In Boxes containing 8 Lights and Glass.
These are smaller than "FAIRY" Lights, consequently less expensive, and will burn in any of the "Fairy" or "Fairy-Pyramid" Lamps.



"FAIRY" LIGHT.
10/6 per dozen Boxes.
With Double Wicks, in Boxes containing 6 Lights and Glass, burn 10 hours each.

*"FAIRY-PYRAMID" LIGHT
8 Lights and Glass in Box,
7/- per dozen Boxes.
SINGLE WICK. Burn 10 hours.
These are smaller than "FAIRY" Lights, consequently less expensive, and will burn in any of the "Fairy" or "Fairy-Pyramid" Lamps.

* *ALL THESE LIGHTS WILL BURN IN "FAIRY," "FAIRY-PYRAMID" and "PYRAMID" LAMPS.*

CLARKE'S
NEW PATTERN, including BRASS "PYRAMID" LAMP,* and REGISTERED PANNIKIN,

By this invention any liquid food can be poured out, or drunk, without scum or grease passing through the spout, and prevents spilling when poured into a Feeding Bottle, so unavoidable with all other Pannikins.

These Pannikins will fit all the old "Pyramid" Nursery Lamps, and can be purchased separately.

*** N.B.—The Brass Lamp is a great convenience.**

*** If without Brass Stand, 3/- per doz. less.**

			Each.	Wholesale. Per Doz.	Extra Pannikins.	Regist'd Lids.
No. 1	Holds Half-pint Food, besides Water,	Price	3/6	30/-	6/-	2/-
No. 2	,, Three-quarters Pint Food	,,	,, 5/-	33/-	8/-	2/-
No. 3	One Pint Food	,,	,, 6/-	36/-	9/-	3/-

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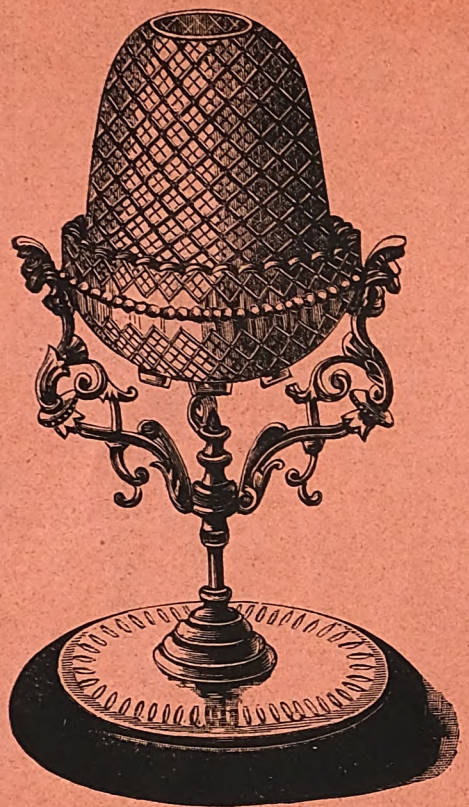
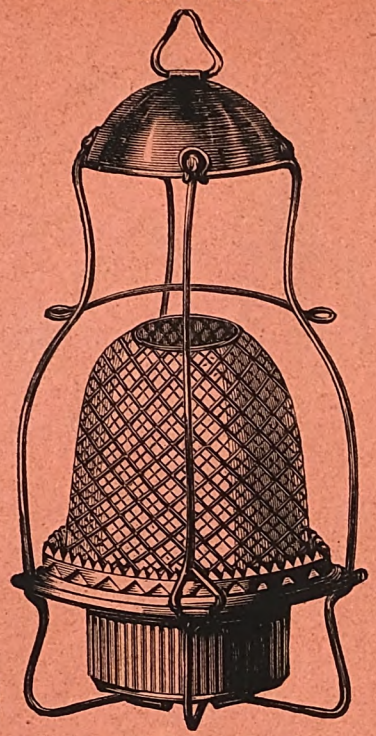
CLARKE'S "FAIRY-PYRAMID" LAMPS.



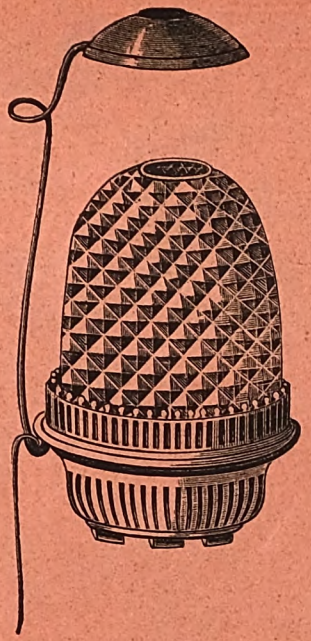
No. 293—ORMOLU, 36/- per dozen,
with Mirror and Plush Stand.

Weather Proof.



No. 289—Registered No. 95,261
Japanned, 7/- per dozen.

Weather Proof.



No. 289½.
Japanned, to fix in ground.
Frame only, 2/- per dozen.
Any "Fairy-Pyramid" Lamp
will fit.

No. 288—ORMOLU, 24/- per dozen.

(N.B.—THESE DESIGNS ARE ALSO MADE IN "FAIRY" SIZE.)

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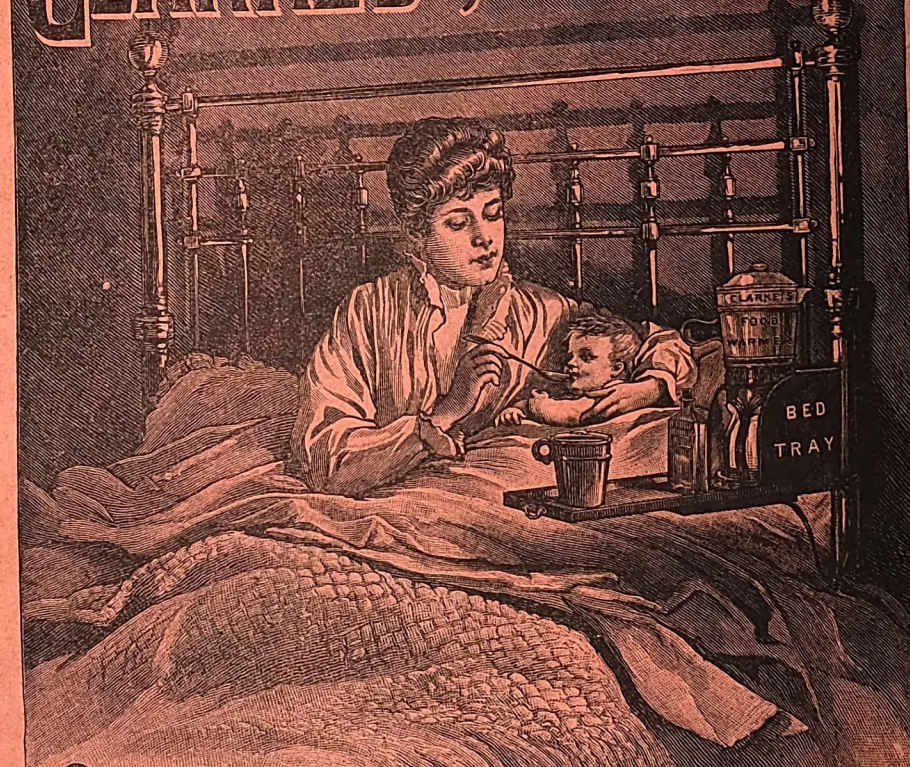
CLARKE'S "PYRAMID" AND "FAIRY" LIGHTS

Are Warranted **FREE** from

PARAFFIN OR OTHER DANGEROUS MATERIAL.

N.B.—A Separate Price List for "FAIRY" Lamps on Application.

CLARKE'S "Pyramid" LAMP



CLARKE'S "Pyramid" LAMP

Food-Warmer and Bed-Tray.

INDISPENSABLE FOR THE INVALID'S ROOM OR THE NURSERY.

Combines Night Light, Food-warmer, Bed-tray & Book-rest.

Sold by all dealers in CLARKE'S "FAIRY" LAMPS.

NB. Each "Pyramid" Lamp and Light is stamped with trade mark "Pyramid."

N.B.—Coloured Sheets of all New Designs on Application.

A Full Size Pattern Book of over 300 Designs, Price 2/6, or Credited on return within a Month.

Far, Far and Away the Best for Home Use or for Export.

"PYRAMID" & "FAIRY" LIGHT CO., LIMITED, LONDON, N.W.

SHOW ROOMS:—31, ELY PLACE; & 484, COLLINS STREET, MELBOURNE.

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DOULTON'S
PORTABLE
GLAZED WARE GAS STOVES

PERFECT COMBUSTION.

DIRECT RADIATION.

PATTERN G.A.

FREEDOM FROM SMOKE OR SMELL.

These attractive Stoves are constructed entirely of Glazed Fireclay, which evenly radiates the heat, and presents a bright and cheerful appearance. The Patent Asbestos Arch is fixed immediately above the burners, and secures the perfect combustion of the gas. It further obstructs the heat from rising and throws it by direct radiation on to the floor. Illuminating gas is used, and absolute freedom from smoke or smell is ensured.

These Stoves are specially adapted for heating Halls, Corridors, Bedrooms, Offices, and similar apartments, and can safely be used without a flue. They are supplied in various colours and styles of decoration *to order*, and kept in stock in Brown Glazed Exterior with Amber Reflector.

WILL BURN FOR THREE HOURS AT THE COST OF ONE PENNY.

DOULTON & CO.

Head Offices — HIGH STREET, LAMBETH, LONDON, S.E.
Show Rooms—ALBERT EMBANKMENT, LAMBETH, S.E.

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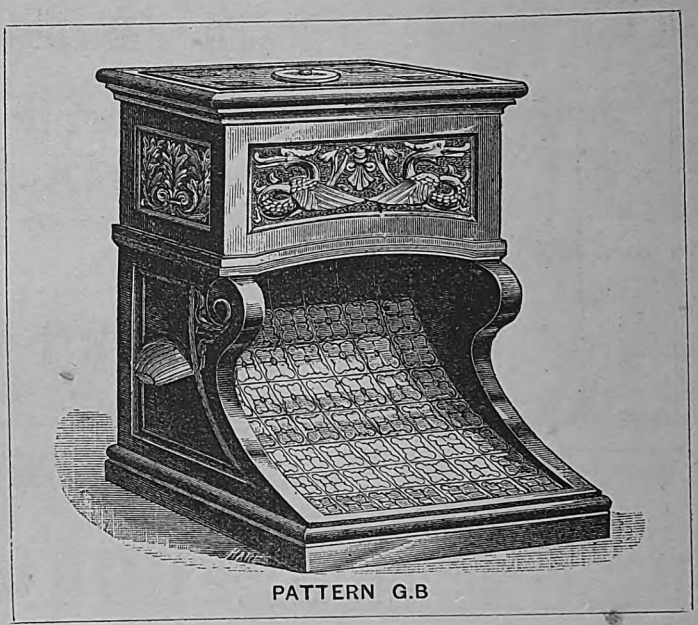
DOULTON'S
PORTABLE
GLAZED WARE GAS STOVES



PATTERN G.B

SPECIALLY ADAPTED FOR BEDROOMS, NURSERIES, &c.

This pattern is provided with a movable piece in centre of top, so that water, &c., may be boiled in a few minutes.

PRICE.

In Brown Glazed Exterior, with Amber Reflector,

£1 : 18 : 0.

DOULTON & CO.

Head Offices—HIGH STREET, LAMBETH, LONDON, S.E.
Show Rooms—ALBERT EMBANKMENT, LAMBETH, S.E.

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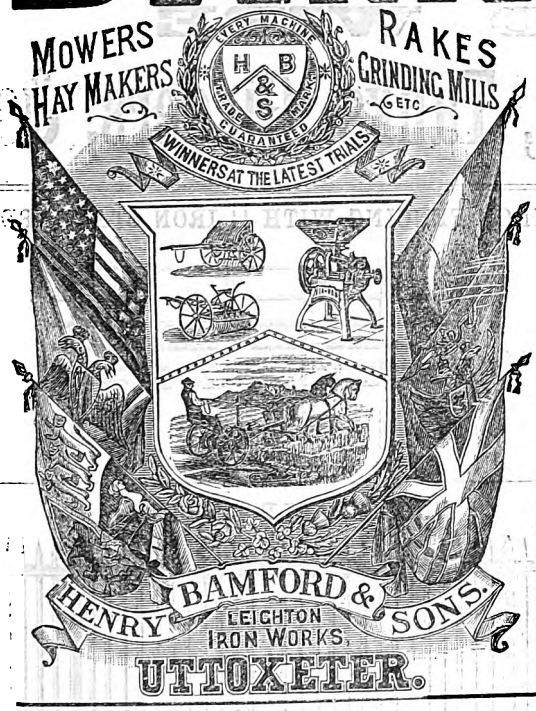
BAMFORD'S



HIGHEST PRIZE GOLD MEDAL

RAPID

CORN GRINDING MILLS,

Chaff Cutters, Pulpers, Oilcake Mills, Horse Gears,

CHAIN, LIFT, & FORCE PUMPS, &c.

Please Note

SPECIAL FOUR-PAGE ADVERTISEMENT

In Present Issue.

And send for NEW ILLUSTRATED CATALOGUES to the Patentees and Manufacturers—

H. BAMFORD & SONS,

LEIGHTON IRONWORKS, UTTOXETER.

Continued Success of the "Albion" Mowers and Reapers

IN THE TRIAL FIELDS OF FRANCE.

HARRISON, McGREGOR & CO.

Have already been awarded during the present Season

SIXTEEN FIRST PRIZES

GOLD & SILVER MEDALS, &c.,

In the various Trials and Exhibitions of 1890.

At the Paris Universal Exhibition, 1889, H., McG. & Co. were awarded

THREE GOLD MEDALS, viz.:

A GOLD MEDAL for the General Excellence of their Exhibits of MOWERS and REAPERS.

THE HIGHEST AWARD, FIRST PRIZE, GOLD MEDAL, to the New Patent "Albion" No. 5 Mower, at the International Field Trials held in connection with the Exhibition.

THE HIGHEST AWARD, FIRST PRIZE, GOLD MEDAL, to the "Albion" No. 4 Self-Delivery Reaper, at the International Field Trials held in connection with the Exhibition.

HARRISON, McGREGOR & CO. were the **ONLY** European Manufacturers who gained *the Highest Award in all the Classes in which they Competed. No Higher Honours were obtainable.*

363 FIRST PRIZES, GOLD & SILVER MEDALS, CUPS, ETC.

Gained since 1878 at the principal Field Trials and Competitions against the Machines of all the Leading Makers in the World.

Address—ALBION IRON WORKS, LEIGH, LANCASHIRE.

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LUDLOW BROTHERS

Postal Address: LUDLOW BROS., BIRMINGHAM. Telegraphic Address: "LUDLOW BIRMINGHAM."

PALMER STREET, BIRMINGHAM,

MANUFACTURERS OF

GALVANIZED IRON, CORRUGATED AND PLAIN SHEETS,

Ridge Capping, Down Pipes, Gutters, Screws, and all Fittings,

FOR THE HOME AND FOREIGN TRADE.

ALSO MAKERS OF ALL KINDS OF GALVANIZED HOLLOW-WARE GOODS.

REGISTERED BRANDS FOR SHEETS.

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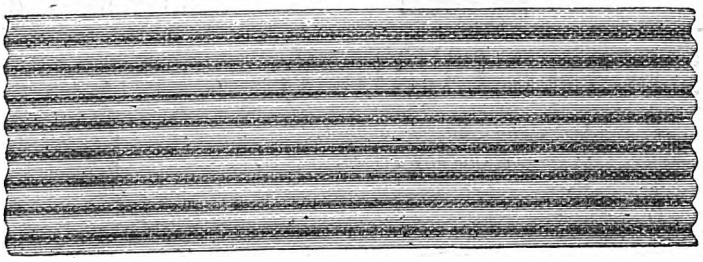
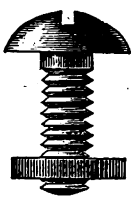
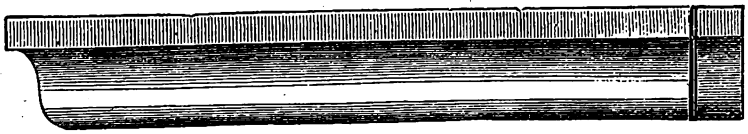
BEST QUALITY.



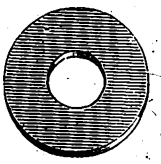
STRONG GUTTERS, RIDGING, ETC., FOR THE HOME TRADE.



Nut and Bolt.

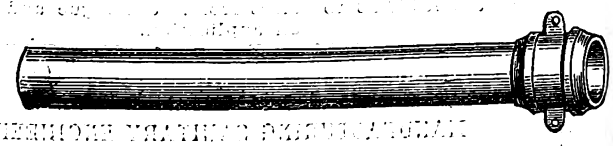


O.G. Gutter.

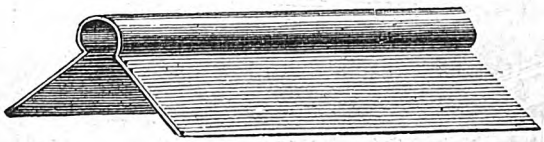


Washer.

Half Round.



Round Pipe.



Strong Galvanized Iron Ridge Capping.

ILLUSTRATED LISTS AND SPECIAL PRICES QUOTED UPON RECEIPT OF APPLICATION.

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BIRMINGHAM.

REGISTERED TRADE MARK

Price Lists and Samples may be obtained through all Ironmongers and Factors.

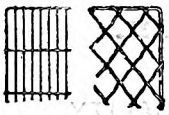
B. M. RENTON,

Steel & Iron Merchant,
28 Change Alley, Sheffield.

WANTED.

OLD ENGLISH-MADE FILES, and OLD IRON and STEEL TYRES.

WINDOW GUARDS
And Wire Work of every description.



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Cateaton Street, MANCHESTER

(Not connected with any other firm of similar name.)

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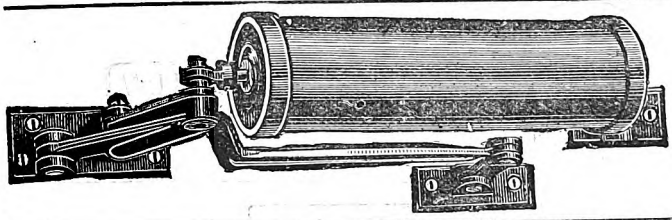

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NEW AIR CHECK & SPRING.

Contains Advantages and Improvements not found in any others, and is 30 per cent. cheaper in price

Can be instantly disconnected without unscrewing

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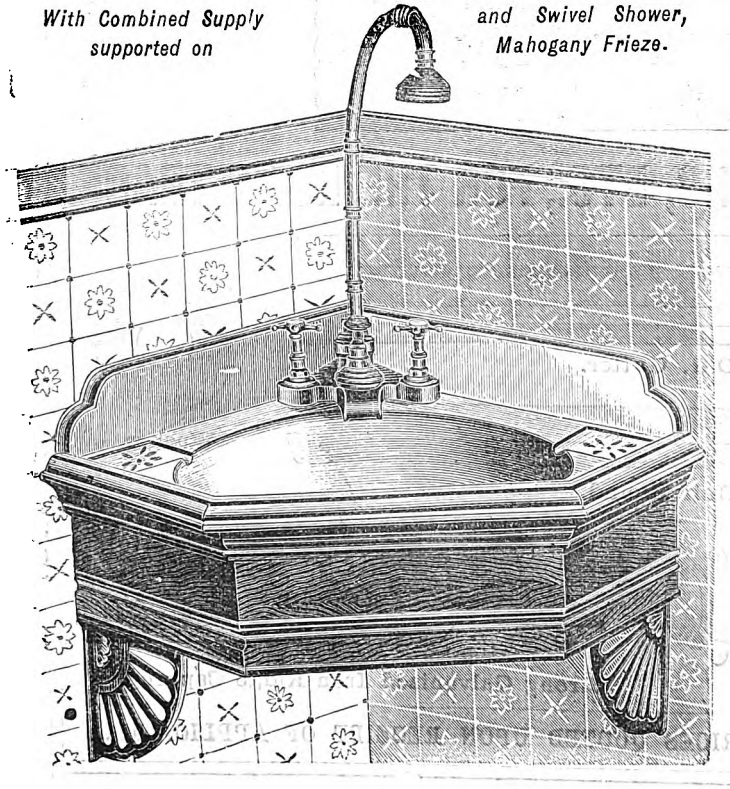

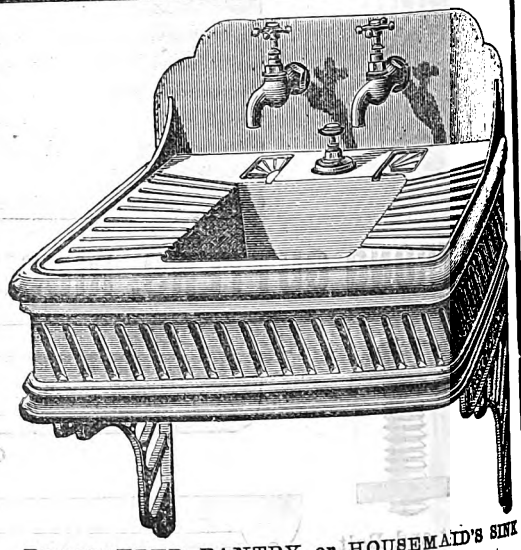

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SPECIALITIES:

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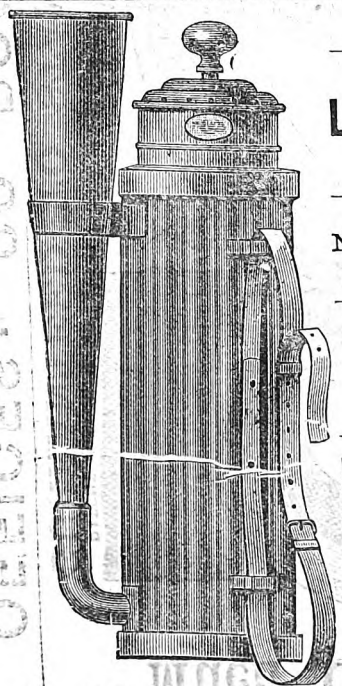
OF EVERY DESCRIPTION.



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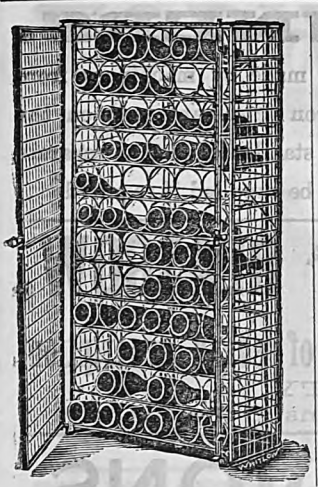

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2 ft. 6 in. wide, 4 ft. 10 in. high, 1 ft. 2 in. deep.

Will hold 6 dozen Champagne or Ordinary Wines or Small bottles.

It is covered with 1½ in. Mesh Wirework at sides and top.

When fastened to a wall, and the door padlocked, the bottle cannot be removed.

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Wire Drawers, Weavers & Workers,

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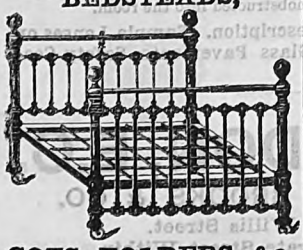

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Standard Bedstead Works,
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We beg to call special attention to our

PATENT WIRED TOP KETTLES

AND

PATENT BARREL HANDLES.

These Handles are totally different to others in the market, being made only in one piece, and can be applied to Buckets, Boiler Fillers, Slop Pails, Water Bowls, &c.

List of Prices and Particulars on application.

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TEA KETTLES,

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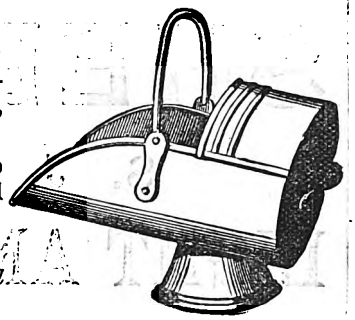
Galvanised Buckets, Baths, Washups, Slop Pails, Watering Cans, Boiler Fillers, Coal Hods, Waterloos, Scoops, &c., &c.



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MANUFACTURERS OF SHEET METAL GOODS,

ARGYLE WORKS, BIRMINGHAM,

HAVE THE PLEASURE TO SUBMIT TO YOUR NOTICE THEIR NEW

ARGYLE COPPER TEAPOT,

THE ONE-PINT SIZE OF WHICH IS NOW READY.

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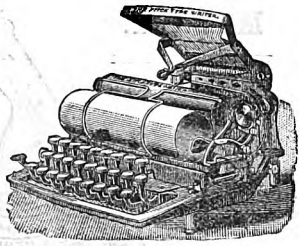

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SOLE MAKERS OF THEIR PATENT

"MERRITT" CORK DRAWER.

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BEER ENGINES,

And all BAR and HOTEL REQUISITES.

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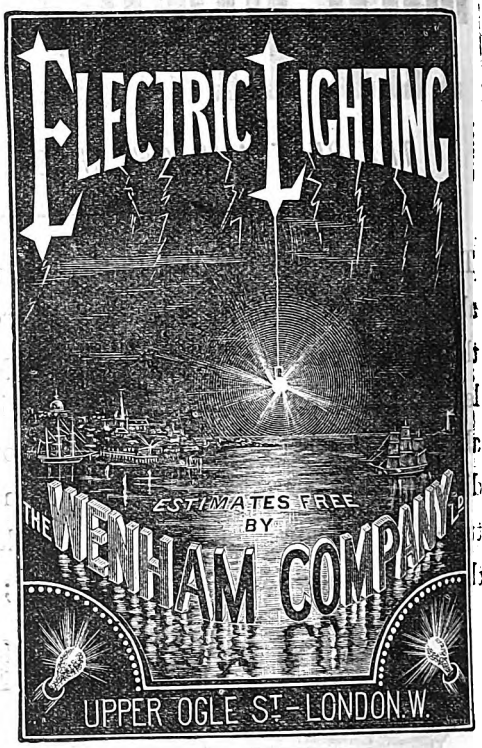

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KNIFE CLEANERS

WILL SHORTLY INTRODUCE SEVERAL

NEW AND IMPORTANT

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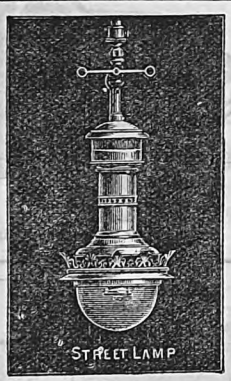

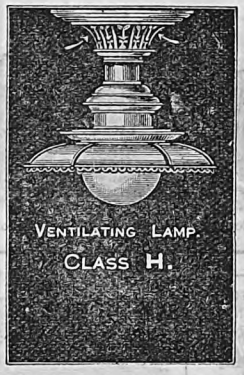

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Can be used as Ventilating Lights.

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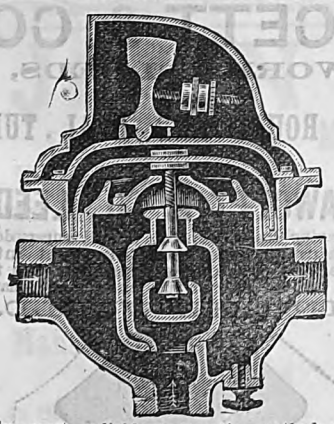
As supplied to and approved of by H.M. Government.



The most reliable automatic method of economising Gas without reducing the illuminating power.
HUNDREDS ALREADY FIXED.

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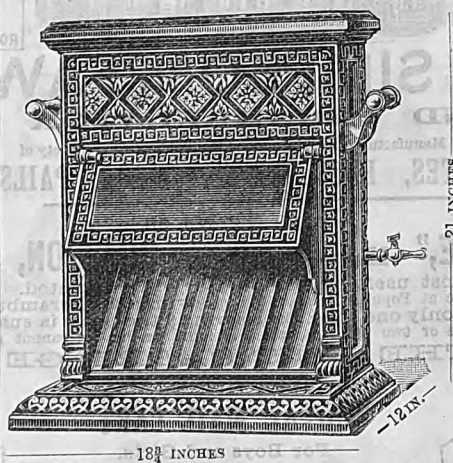
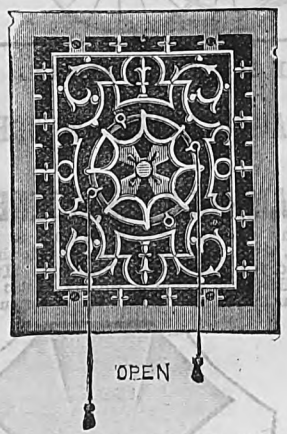


Black Cast Iron with artistic tile fronts, tiled hearths, and coloured glass canopy.

THE "WENHAM"
IMPROVED
LOUVRE VENTILATOR



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WENHAM AUTOMATIC WATER HEATERS. For Restaurants, Hotels, &c.
ELECTRIC LIGHT FITTINGS AND INSTALLATIONS.

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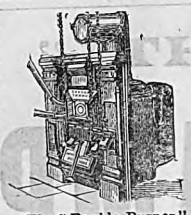
Save Fuel, Wasteful Fires Smoke, and Dirt. The most Perfect System for Heating Hotels, Restaurants, Schools, Churches, Houses, Institutes, &c.



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58 CITY ROAD, LONDON.

The most complete and best-made Machinery and Utensils for the Bread, Biscuit, Confectionery and Chocolate Trades.

HIGHEST AWARDS, 15 GOLD MEDALS.

Highest Award, London, 1884; Highest Award, Adelaide, 1887;
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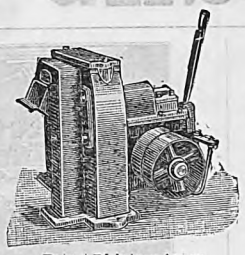
The Bailey-Baker Ovens.

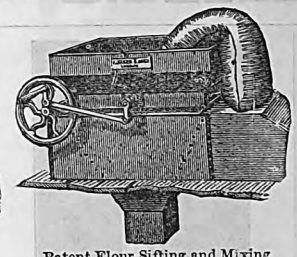
The most Perfect Oven for Bakers, Confectioners, Restaurateurs, Institutes, &c.

Patent Table Dough Divider.

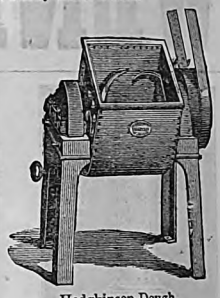
Swing or Tip Steam Copper Pans.



Patent Disintegrator or Sugar Mills.

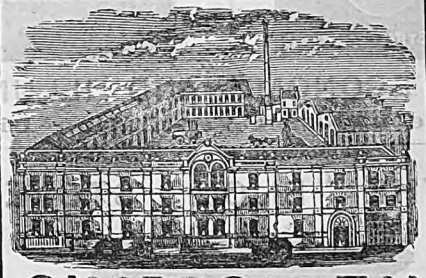


Patent Flour Sifting and Mixing Machine.



Hodgkinson Dough Kneader.

ESTABLISHED 1859.



ROYAL MAIL CART

SIMPSON, FAWCETT & CO.

LEEDS PAIL AND PERAMBULATOR WORKS, LEEDS,

Manufacturers to Shippers and the Trade of every variety of

PERAMBULATORS, WOODENETTES, BASSINETTES, WOOD PAILS, ROUND AND OVAL TUBS.

PATENT No. 56.

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This Carriage, "PATENTED," is the **most useful Perambulator ever invented.** Having confidence that it will supersede all others, we have determined to offer it to the public at Popular Prices. This **new unique Perambulator surpasses anything yet introduced for Ease and Comfort. It has only one long steel spring; the body is suspended by four straps from the two handles;** the spring is equally elastic for one or two children, whether light or heavy; cannot get out of order or run on one side; having two handles, can be pushed from either end. THE BEST CARRIAGE IN THE WORLD.

ROYAL MAIL CART

For Boys and Girls.
Patented, No. 12,785.

SIMPSON, FAWCETT & CO. are the ORIGINAL PATENTEES AND MANUFACTURERS *of the "Royal Mail Cart," for Boys and Girls, and are sorry to have to caution the Public against imitations; many are dangerous, and all far short of the strength of the "Royal Mail Cart," which still holds the field. Ask for the* "PATENT ROYAL MAIL CART," *and you may depend on it being the* STRONGEST TOY MADE.

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LIMITED,

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DECORATED TIN-PLATES,

CRYSTALLIZED TIN-PLATES,

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SPECIALITIES:

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FANCY BISCUIT BOXES & CANISTERS,

DECORATED IN COLOURS.

SEAMLESS DECORATED TIN BOXES

FOR POLISHING PASTE, BLACKING, &c.

INDESTRUCTIBLE METAL ADVERTISING TABLETS,

IN ALL SIZES, DESIGNS, AND COLOURS.

AWARDED FIRST ORDER OF MERIT, ADELAIDE EXHIBITION, 1887.

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NONE GENUINE UNLESS BEARING THE

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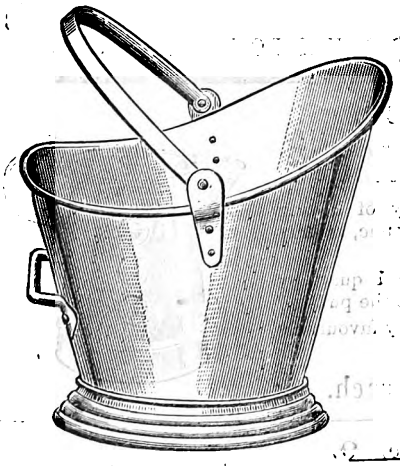
JAPANNED, GALVANISED, AND ZINC LINED

WATERLOO COAL SCOOPS,

LONDON COAL SCOOPS AND UPRIGHT HODS.

These Goods may be had Filleted outside with Gold Bands or Painted various colours Imitation Zinc-lined at half the cost.



IRON ALL-BRAZIERED TEA KETTLES

THE NON-SUCH PATENT STEEL TEA KETTLES.

NEW PATTERNS. PURE TINNED.

SPECIAL CHEAP PATENT STEEL RANGE KETTLES.

ALSO OF

Galvanised Buckets, Baths, Boiler Fillers,

and every description of

IRON PLATE AND BRAZIERY GOODS, FOR HOME AND EXPORT.

QUALITY AND FINISH UNEQUALLED.

THE BEST VALUE IN THE MARKET.

Buyers should see our Supplementary List of New Patterns, &c., before ordering elsewhere.

BELMONT WORKS, BIRMINGHAM.

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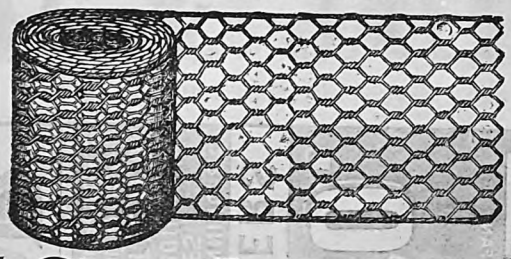
Telegrams: "NETTING BIRMINGHAM."

SPECIALITY

WIRE NETTING

Stock over

500,000 yards.

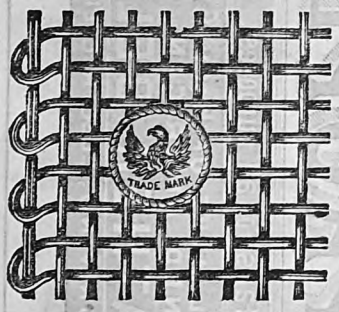


Wire Workers & Weavers.
Manufacturers of
Brass, Copper, Iron, and
Galvanized Wove Wire
Sieves, Riddles, &c., &c.

LAWES, ASH & CO.

PRINCIP STREET, BIRMINGHAM.

JOSEPH NICHOLS & SON



(ESTABLISHED 1841)

GENERAL WIRE WORKERS AND WEAVERS,

Are the largest Makers of Wove Wire, and holding the largest and most complete stock in the United Kingdom.

EVERY DESCRIPTION OF WIRE GOODS. SPECIALITY FOR SHIPPERS.

CHEAPSIDE WIRE WORKS.

BIRMINGHAM.

Medal and Highest Award, Adelaide, 1887, and Melbourne, 1888-9.

FREDERICK SMITH & CO., CALEDONIA WORKS, HALIFAX,

MANUFACTURERS OF ALL KINDS OF

IRON AND STEEL WIRE AND FENCING STRAND.

SPECIALITIES—

BEST TELEGRAPH and TELEPHONE WIRE.
COPPER WIRE, hard drawn, high conductivity.
COPPER WIRE, for all purposes.
COPPER TAPE or STRAND, for Lightning Conductors, in 200 feet lengths and upwards.

PRIZE MEDALS—

London, 1862; Paris, 1867; Moscow, 1872; Vienna, 1873; Philadelphia, 1876; Paris, 1878.

CLYDE NAIL COMPANY, LIM.

NEWTON, GLASGOW,

MANUFACTURERS OF

PATENT STEEL ROSE NAILS,

FLAT AND SHARP POINTS.

CUT STEEL NAILS & FLOORING BRADS,

American Patterns in Steel Cut Clout Nails, Finishing Nails, and Brads,

TACKS, GIMP AND COFFIN PINS CUT COPPER TACKS AND NAILS.

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H. A. KNOX & CO., 58, 59, & 60 HOUNDSDITCH, LONDON, E.C.

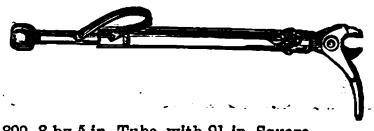
JOHN ENGSTRÖM'S
Swedish Mechanical Safety Knives.

OPEN.

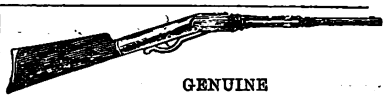
CLOSED.

Price	11/9	12/	13/	14/	16/9	20/ doz.
No. ..	4	3	2	1	01	0
Size..	2½	2⅝	3¼	3⅝	4⅛	4⅝ in. handles.

NAIL PULLERS.



No. 899. 8 by ⅝ in. Tube, with 9½-in. Square-headed Rammer .. .. .. 15/6 doz.
„ 900. 11 by ⅞ in. do., with 12-in. do. .. 26/- „
„ 901. 14 by 1 in. do., with 15-in. do. .. 34/- „
Warranted made of best materials, with Steel Jaws.
All of the above sizes, small as well as the large, are carefully tested before leaving the factory.



GENUINE

"GEM" AIR GUNS.

No. 1. 4½ m/m bore, best quality .. 14/6 each
No. 1. 6½ „ „ .. 16/6 „
No. 2. 4½ m/m bore .. .. .. 22/ „
No. 2. 6½ „ .. .. .. 23/ „

Steel Darts for "Gem."

4½ m/m .. .. 7*d.* per doz. .. 6/ per gross.
6½ „ .. .. 1/6 „ 16/ „

Slugs for "Gem."

4½ m/m .. .. 8*d.* and 10*d.* per thousand.
6½ „ .. .. .. 1/6 „

JAPANNED HAND, VAN, & BULL'S-EYE LANTERNS.

No. 60 × 00. 4 in. by 2½ in. P.R. 4/9 doz.
No. 60. × 00. P.R. & O.W. 5/7 doz.

No. 16. 8/5 doz. 5⅜ in. by 3½ in. P.R. & O.W.

No. 17. 10/6 doz. 6¼ in. by 3⅜ in. P.R. & O.W.

No. 225. 16/ doz. 6½ in. by 3½ in. P.R. & O.W.

No. 15. 22/ doz. 6½ in. by 4¼ in.

No. 222.
No 1. 6½ in. by 3½ in. 20/ doz.
„ 2. 7 in. by 4½ in. 23/ doz.
„ 3. 7⅝ in. by 4½ in. 27/ doz.

No. 210. 20/ doz. 6¾ in. by 2¾ in. Plate-glass sides and front, Hook at back. P.R. & O.W.

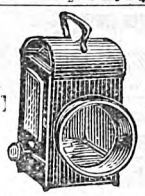
Tricolour. No. 122. 17/6 gross. For Candle.
No. 82 × 00. with Door. For Oil. 30/ gross.

No. 300.
Size 00..2/6 doz.
„ 0. 5/6 „
„ 1..7/ „
„ 2..8/ „

No. 340.
Size 1..13/6 doz.
„ 2..15/ „
„ 3..21/ „
„ 4..27/ „
With Plated Reflectors.

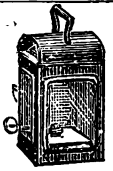
No. 400.
Size 1 .. 18/6 doz.
„ 2 .. 21/ „
„ 3 .. 27/ „
„ 4 .. 34/ „
With Plated Reflectors.
Darkens from Bottom

No. 23.



No. 23.
Size 0, 7¼ in. by 4 in. .. 45/ doz.
„ 1, 8½ in. by 4½ in. .. 58/ „
„ 2, 9 in. by 5 in. .. 72/ „
A Strong Warehouse or Dashboard Lamp, with Plated Reflector, Outside Winder, and Hook at back.

No. 26.
7½ in. by 4 in., 36/ doz.
A Strong Warehouse or Dashboard Lamp, with Hook at back.
P. R. & O. W.



No. 270.
7½ in. by 4 in., 22/ doz.
A Good Hand or Van Lamp, with Plated Reflector, Outside Winder, and Hook at back.

P.R. Signifies Plated Reflectors, and O.W. Outside Winders.

Reese's New Patent Adjustable Stencil Letters.
The Latest and Best. Cheap and Convenient.

No. .—Two A Fonts—55 pieces.
Boxed with Ink and Brush, all letters.

No. 2,	¾ in.	in size.. ..	3/9
„ 3,	1 in.	„	4/
„ 4,	1½ in.	„	5/

No. .—Three A Fonts—70 pieces.
Boxed with Ink and Brush, all letters, assorted.

No. 9,	½ in.	in size ..	4/3
„ 10,	¾ in.	„ ..	4/6
„ 11,	1 in	„ ..	5/
„ 12,	1½ in.	„ ..	6/
„ 12½,	2 in.	„ ..	8/6

No. .—Three A Fonts—90 pieces.
Boxed with Ink and Brush, 70 letters and 20 figures, assorted.

No. 13,	½ in.	in size ..	5/
„ 14,	¾ in.	„	5/9
„ 15,	1 in.	„	6/6
„ 16,	1½ in.	„	7/6
„ 16½,	2 in.	„	10/

Please order Fonts by Numbers.

FIGURES ONLY.

In Sets of 15 pieces.

In Boxes as follows :

½ in.	..	..	1/
¾ in.	..	..	1/
1 in.	..	..	1/3
1½ in.	..	..	1/6
2 in.	..	..	2/
2½ in.	..	..	2/6

In Sets of 20 pieces.

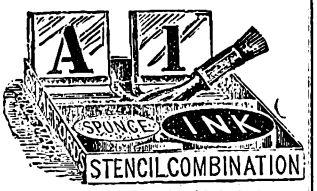
In Boxes.

½ in.	..	..	1/3
¾ in.	..	..	1/6
1 in.	..	..	1/9
1½ in.	..	..	2/
2 in.	..	..	2/6
2½ in.	..	..	3/3

STEEL STOVE SHOVELS.

No. 1. 4½ in., 2/3 doz.; No. 2. 5 in., 2/10 doz; No. 3, 5½ in., 3/6 doz.; No. 4, 6½ in., 4/2 doz.

STAFFORD'S STENCIL COMBINATIONS.



Box containing the Alphabet, Figures, Ink, and Brush.

½	¾	1	1½	2	2½ in.
21/	23/	25/	32/	36/	43/ 64/ doz. sets.

The Compartment Font Interchangeable Lock Stencils.

Consists of 100 pieces, viz. :—

A3	B2	C2	D2	E4	F2	G2	H2	I4
J2	K2	L4	M2	N3	O3	P2	Q1	R3
S4	T3	U2	V2	W2	X1	Y2	Z1	&1
12	22	32	42	53	62	72	£2	92	03	£1	s1	d1

Placed in a wooden box 10½ in. long, having a core with slots sawed in it ¼ in. apart, keeping each character in an upright position, with sufficient space between to get at them conveniently.

This is a neat, merchantable article with no tail ends, shows up well in the store, and has a ready sale.

They are made in four sizes, with prices as follows :—

½ in.	Compartment Font	.. ..	4/6 each.
¾ in.	„	.. ..	5/- „
1 in.	„	.. ..	5/6 „
1½ in.	„	.. ..	7/- „

Prices as above are net, subject to a CASH Discount of 5 per Cent. off amounts over 20s. for prepaid Cash; smaller amounts absolutely net.

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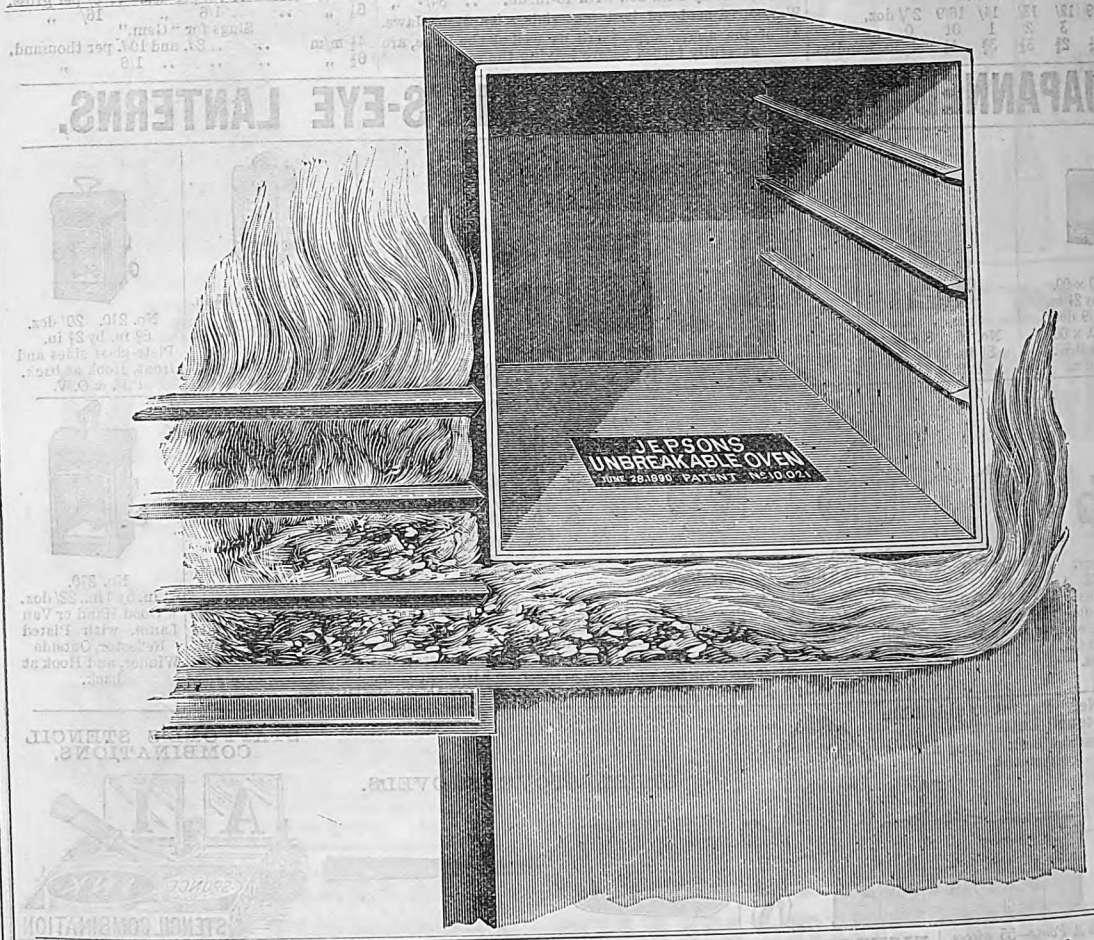
JEPSON'S UNBREAKABLE OVEN

(Patent 10,021, June 28th, 1890.)



The simplicity of application, with very little extra cost in Manufacture, is the chief object of my patent.

My patent consists of a THIN Sheet of Wrought or Rolled Iron or Steel (with or without perforation, as required) placed in the centre of the mould, the Cast Iron then poured in the usual way runs to each side, producing the casting with a thin core of the above metal in the centre, rendering the casting much stronger and really toughening the Iron. The THINNESS of the metal allows it to combine readily with the Cast Iron, so that no chilling takes place in the casting.

No Oven must be turned out of any Foundry without the official stamp, which must appear upon the inside bottom plate of the oven, as in the above illustration.

The stamp can be obtained upon payment of the Royalty Fee, which will be regulated according to the output of goods with the applied patent.

Terms will be made within the reach of all Ironfounders. Further particulars on application.

Yours faithfully,

ARCADE CHAMBERS, ST. MARY'S GATE, MANCHESTER. **A. JEPSON.**

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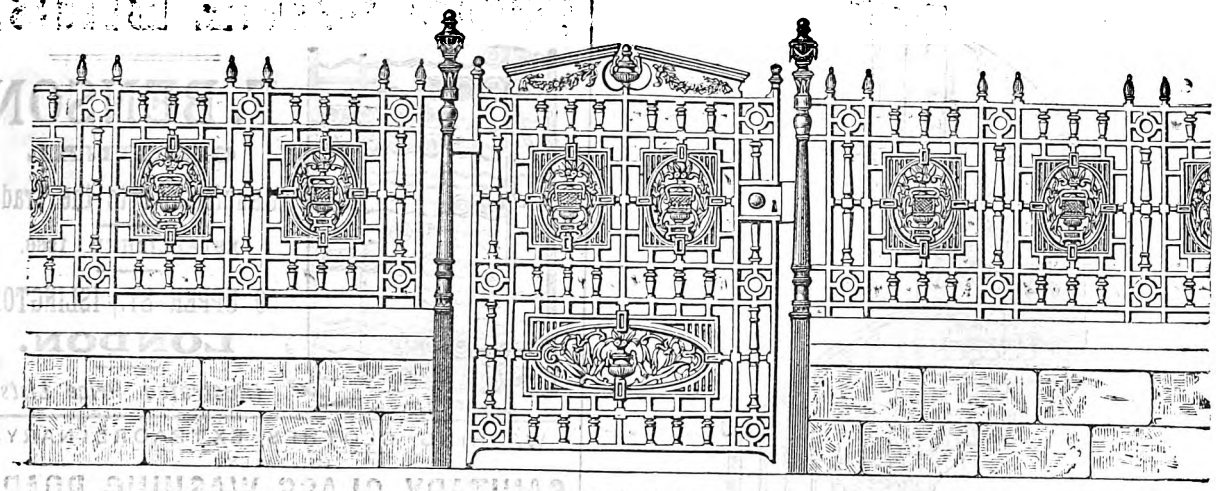
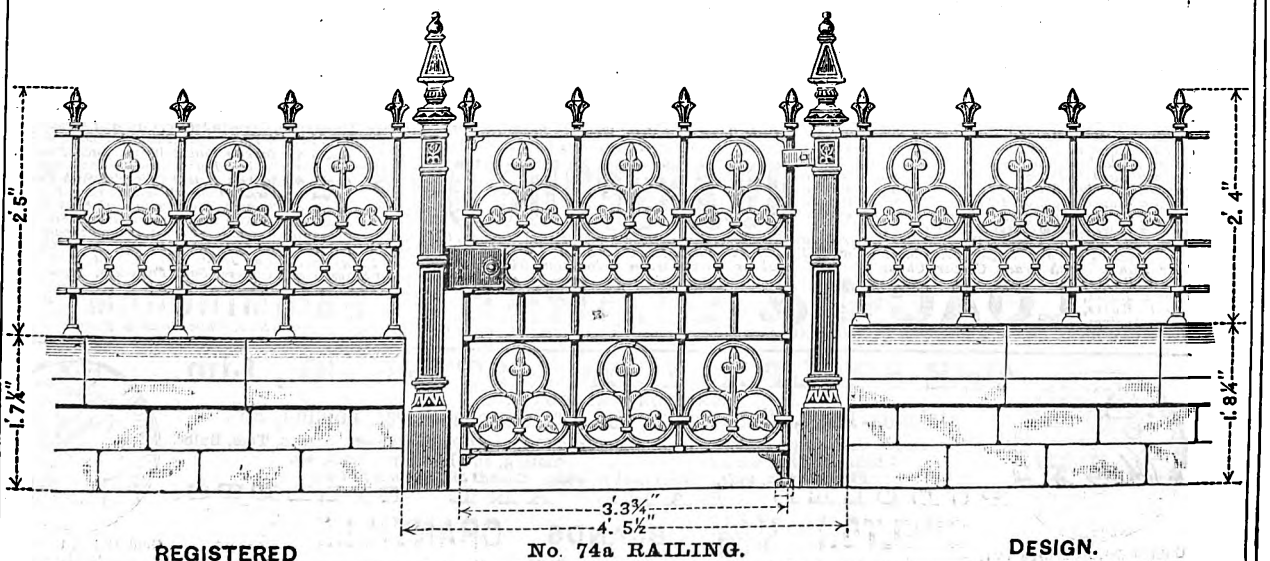


REGISTERED No. 84 RAILING. DESIGN. [2]

SPRINGFIELD FOUNDRY CO. FALKIRK.



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GEORGE ADAMS & SONS,

MARS IRON WORKS,

WOLVERHAMPTON,

SOLE MANUFACTURERS OF

ADAMS-MARS

GALVANIZED CORRUGATED SHEETS,

GALVANIZED FLAT IRON SHEETS,

GALVANIZED FLAT STEEL SHEETS,

SHEETS, HOOPS, BARS,

OF BEST QUALITY.

London Agent—JAMES SLACK, 63 Bishopsgate Street Within, LONDON, E C.

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WARREN'S

"NEW PRESSURE."

REGISTERED.

THE "NATIONAL."
THE "PREMIER."
THE "RELIANCE."
THE "NEW PRESSURE."

1 Knife only	... ...	10/6
2 Knives and Carver	... ...	16/0
3 "	"	27/0
4 "	"	40/0

KNIFE CLEANERS.

"THE NATIONAL."

THOUSANDS IN USE.

LISTS ON APPLICATION. FOREIGN APPLICATIONS THROUGH MERCHANTS & SHIPPING AGENTS.

55 ST. PAUL'S SQUARE, BIRMINGHAM.

Telegraphic Address—"ELECTROPLATE BIRMINGHAM."

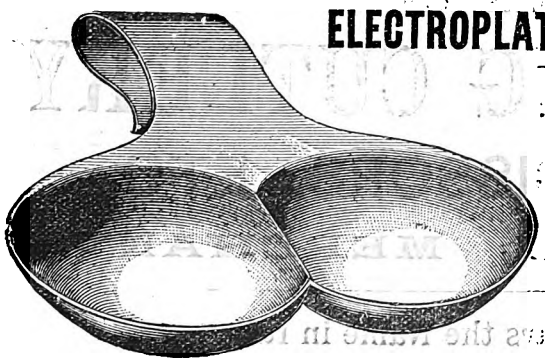
DEYKIN & SONS,

ELECTROPLATERS,

VENETIAN WORKS, JENNENS ROW, BIRMINGHAM,

Manufacturers of all kinds of

ELECTROPLATE FOR HOME AND FOREIGN MARKETS.



Patentees of the

"CRUETINA"

A new Patent Plate Attachment, which economises and prevents Mustard, Salt, &c., from slipping into the plate.

Introducers and Sole Manufacturers of the CELEBRATED GUARANTEED SPOONS AND FORKS, which after several years' public test have proved themselves unequalled by any other articles.

Old Goods Replated equal to new at Moderate Prices.

GUARANTEE OF EXCELLENCE
TRADE MARK
REGISTERED

ESTB.D 1781.

VENETIAN WORKS, JENNENS ROW, DALE END, BIRMINGHAM.

London Agent—Mr. W. H. MARTIN, 2 River Street, Myddleton Square, City.

ESTABLISHED 1784.

THOS. ELLIN & CO.

ESTABLISHED 1784.

VULCAN

SYLVESTER WORKS, SHEFFIELD,

CUTTER

TABLE AND POCKET CUTLERY,

BUTCHERS' SAILORS', PRUNING, & BUDDING KNIVES, RAZORS, SCISSORS, &c.

We would call attention to our UNRIVALLED

SPECIAL "VULCAN" CARVERS AND BUTCHERS' KNIVES,

Admitted to be the BEST by all who have used them.

Shipping Agents for London: PLIMSAUL BROTHERS, 25 Thavies Inn, Holborn Circus, London, E.C.

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SLATER BROTHERS, FITZWILLIAM STREET, SHEFFIELD.

Corporate Marks—

Y NOT VENTURE

W & W WALTER WARRINGTON

TABLE CUTLERY & RAZORS

IN ALL KINDS OF CASES,

Manufacturers of every description of Table and Spring Cutlery, Butchers' Knives and Steels, Razors, Scissors, Spoons, and Forks, and general Electro-platers.

ESTABLISHED 1800.

JOSEPH RODGERS & COMPY.

Howard Street, SHEFFIELD,

MANUFACTURERS OF

TABLE & SPRING CUTLERY

RAZORS, SCISSORS, ETC,

AND GENERAL MERCHANTS.

CORPORATE MARKS 3436.

Observe that each Article bears the Name in full—

JOSEPH RODGERS & COMPY.

JOSEPH RODGERS & COMPANY have (for the convenience of Merchants, Shippers, Ironmongers, &c.) TWO OR THREE THOUSAND DOZENS OF PEN AND POCKET KNIVES ALWAYS IN STOCK, suitable for the American Australian, Continental, or Home Trade. Twenty Thousand of the most Modern Patterns to select from. None but Best Materials used. Send orders for samples.

JOSEPH KERSHAW & CO.

MANUFACTURERS OF

NON-CONDUCTING COMPOSITION

For Coating Steam Boilers, Pipes, Cylinders, and all Steam-heated Surfaces.

WHEEL GREASES, LOCOMOTIVE & WATER-WHEEL GREASES,

Rope Driving Composition, Black and Brown Banding Composition.

Red, Black, and other Coloured Varnishes (for Mill Walls, Marking Skips, &c., &c.), Detergent Composition (for Removing and Preventing Scale in Steam Boilers), Engine and Bolton Polishes, Soft Soap, White Soft Soap for Cop Bottoms White Lead, Oxide and other Coloured Paints. *In Extra Strong Casks for Exportation.*

GREASE, VARNISH, PAINT, & SOAP WORKS, HOLLINWOOD, MANCHESTER.

ESTABLISHED 1843.

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EUREKA GAUGE GLASSES.

TO ENGINEERS AND USERS OF STEAM POWER GENERALLY.

We beg to call your attention to our **Eureka Gauge Glasses.** Their specialities are their **Great Durability.** They bear any **Variation of Temperature,** and do **Not** Change **Colour.**

Our Glasses have recently been tested by an **Inspector** for the **Indian State Railways** to the extraordinary pressure of **6,800 lbs. per Square Inch.** We are satisfied that anyone after giving them a fair trial will use no other.

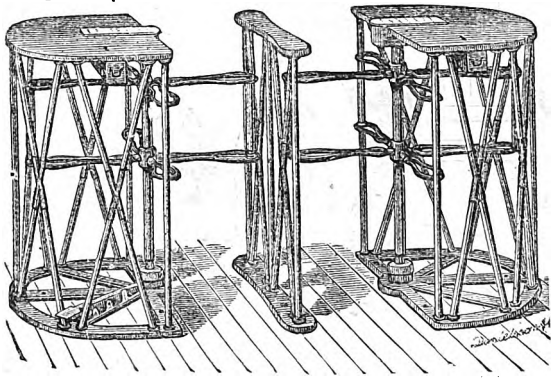
TOMEY & SONS,

TAY GLASS WORKS, PERTH.

ISLER'S PATENT TURNSTILES.

Prize Medals at Inventions and Liverpool Exhibitions.

SUPPLIED OR LENT ON HIRE.

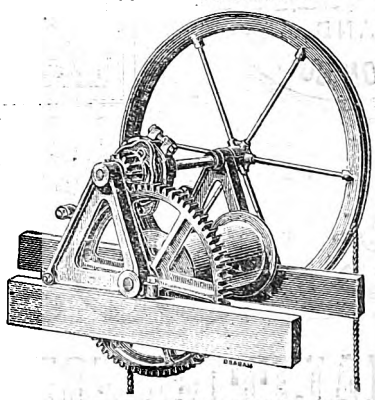


C. ISLER & CO., [2]

Artesian Works, Bear Lane, Southwark, S.

ARCHD. SMITH & STEVENS

SELF-SUSTAINING OVERHEAD HOISTS for Warehouses and Factories.



Seven Sizes from 3 cwt. to 20 cwt.

Never slips. Motion perfectly smooth. Load cannot run down. No brake-rope to trouble with. Silent action. No ratchets.

Catalogues on Application. [2]

QUEEN'S ROAD, BATTERSEA.

FIRE EXTINGUISHING EXTRAORDINARY!!!

"THE MONARCH" CHEMICAL SELF-ACTING FIRE EXTINCTEUR.

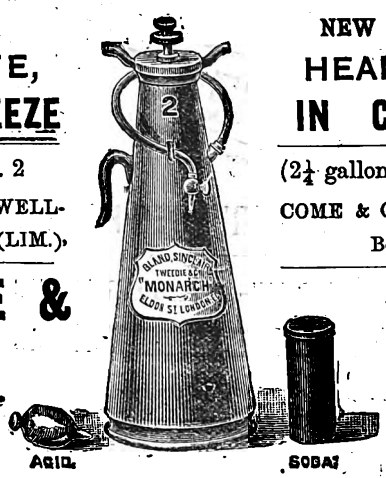
A NEW DEPARTURE.

HARMLESS TO LIFE,

NOT LIABLE TO FREEZE

Increased Power at less Cost, a No. 2

As supplied to Messrs. BURROUGHS, WELL- and PRICE'S PATENT CANDLE CO. (LIM.).



NEW METAL. NEW CHEMICALS.

HEALTH, OR PROPERTY.

IN COLD WEATHER.

(2¼ gallon) being equal to a No. 4 Old Style.

COME & CO. for their new factory at Dartford, Belmont Works, Battersea, S.W.

SINCLAIR, TWEEDIE & CO.,

13 Eldon Street,

LONDON, E.C.

LIBERAL TERMS TO SHIPPERS AND THE TRADE.

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CARRON COMPANY

CARRON, STIRLINGSHIRE.

Manufacturers of all classes of Cooking Apparatus for Hotels, Restaurants, Passenger Steamers, &c., for Coal, Coke, and Steam.

Portable, Open Fire, Close Fire, or Open and Close Fire combined,

KITCHEN RANGES.

NEW SPECIALTY—THE

'BEETONETTE' PORTABLE RANGE

PATENT GAS COOKING AND HEATING APPARATUS,

HOT AIR STOVES & COOKING HEARTHS,

Register Stoves, plain, and in every variety of finish.

STABLE FITTINGS & GARDEN FURNISHINGS.

Heavy Castings, as for Electric Appliances, up to 30 Tons. Every kind of Iron and Brass Castings.

ENGINEERS' & SHIPS' FURNISHINGS.

SHIPS' SIDE LIGHTS, IN IRON OR BRASS.

SPECIALTIES—

COOKING APPARATUS

STABLE FITTINGS & SHIPS' FITTINGS

CONTRACTORS TO THE GOVERNMENT.

BRASSFOUNDERS, GALVANISERS, ELECTRO BRONZERS AND NICKEL PLATERS.

AGENCIES—

15 Upper Thames Street, LONDON. 30 Red Cross Street, LIVERPOOL.

125 Buchanan Street, GLASGOW.

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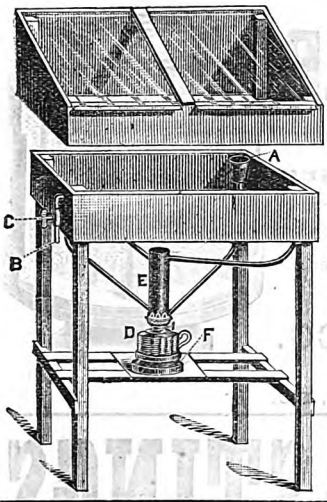
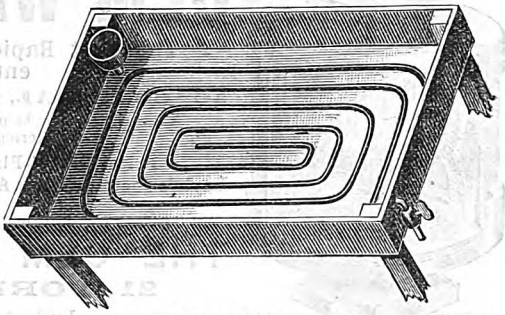


NEW PATENT COIL PROPAGATORS.

80 to 90 degs. of bottom-heat, either in a box or basket, a wire flower-stand, a table, or even a single flower-pot.

These Propagators are heated by a small lamp, the chimney of which is double and made of copper instead of glass, thus forming a boiler, to which is attached a coil of composition gas-pipe. The coil is carried all round the inside of the Propagator, and as the water flows through it keeps up a steady heat, just the same as the hot-water pipes in a greenhouse.

At all prices from 5s. upwards. Send at once for full particulars and Illustrated Price List to



CHAPMAN, CHAPMAN & CO.

MERCHANTS, FACTORS, AND MANUFACTURERS,

BARWICK STREET, BIRMINGHAM.

G. FOWLES & SON

ENGINEERS AND PATENTEES.

SOLE MANUFACTURERS OF

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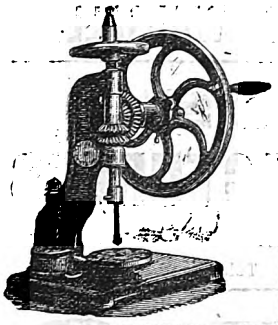

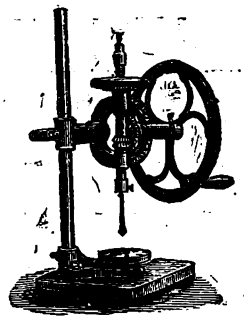

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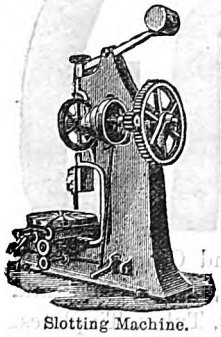


Slotting Machine.

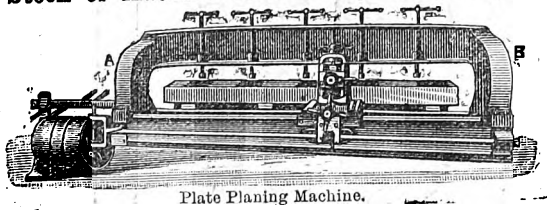
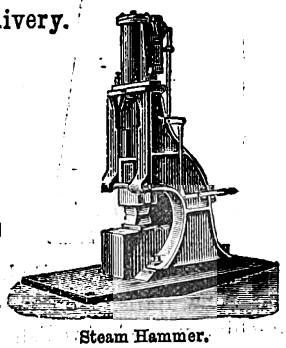


Plate Planing Machine.



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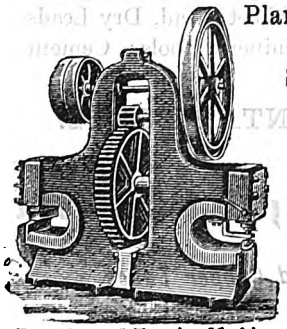
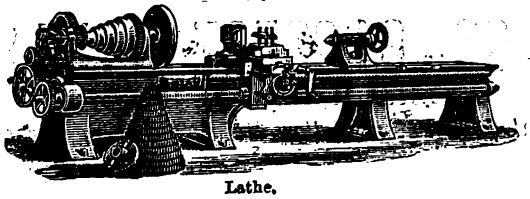
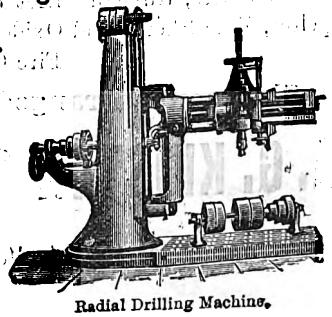


Punching and Shearing Machine.



Lathe.



Radial Drilling Machine.

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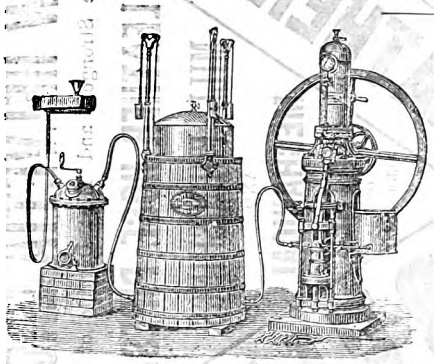
SODA-WATER MACHINERY,

Bottles, Boxes, Ingredients, and all Appliances for the Aerated Water Trade.



The "NIAGARA" MACHINES

are fast superseding all other kinds for the manufacture of first-class Aërated Waters, and are in use in most of the leading manufactories in the world.

A	size, single, as drawing, capacity	600	dozen large bottles per day	£60
B	" " "	1,200	" " "	75
C	" Double Pumps and Cylinder,	2,400	" " "	125
D	" " "	4,000	" " "	180
E	" " "	7,000	" " "	250

THOUSANDS OF TESTIMONIALS HAVE BEEN RECEIVED BY US FROM USERS OF THESE MACHINES.

As the result of recent improvements, our Machinery saves quite 50 per cent. in labour and material.

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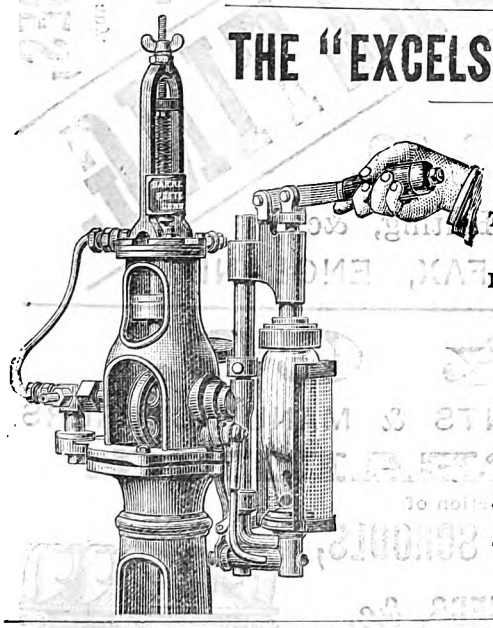

This is the most serviceable, reliable, and economical in the market. A boy can syrup and fill 60 to 80 dozen per hour.

There is no Waste of Syrup, Water, or Gas!

It has the only Syrup Pump where there is no strain upon the glass barrel, consequently this never breaks. The Pump Leather is self-tightening, and will wear and last for years without touching!

It is the quickest in filling!

It is the quickest for altering and adjusting syrup!

It is by far the strongest!

It is comparatively valveless!

It is the simplest to work and most lasting!

It is not liable to get out of order, having but few working parts!

Price, with Glass Barrel Syrup Pump, and all recent Improvements, including also an extra glass barrel and set of spanners,

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BUY THE

"London-Made" Syphon Bottle

(TITLE REGISTERED)

AND SUPPORT BRITISH INDUSTRY.

It is the strongest, cheapest, handsomest, and best in the world.

PURE BLOCK TIN TOPS.

PRICE 1/6 EACH.

Nickel-Plating Tops from 1½*d.* each. Silver-Plating Tops from 3½*d.* each. Marking on Tops free. Marking on Vases free for orders of 1,000.

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"NIAGARA" BOTTLE,

Or Improved CODD'S,

Is admitted to be the most perfect in the market.

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Our experience confirms us in the statement that WHEN ONCE TRIED THE PUBLIC WILL HAVE NO OTHER.

PRICES ON APPLICATION.

Name on Bottles free for Orders of 30 Gross. Under that quantity moulds charged 10/- for each size or shape.

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"NIAGARA" WORKS, 26k EAGLE WHARF ROAD, LONDON, N.

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MAIN DRIVING BELTS

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TWELVE GOLD AND SILVER PRIZE MEDALS.

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RAW HELVETIA LACES,
The Strongest and Most Durable of any.

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'STANDARD' OAK-TANNED

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BUFFALO HAIR AND COTTON BELTS

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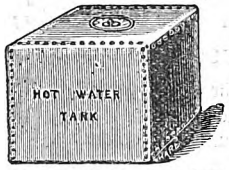

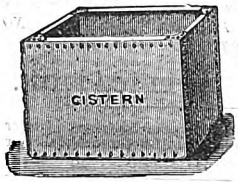

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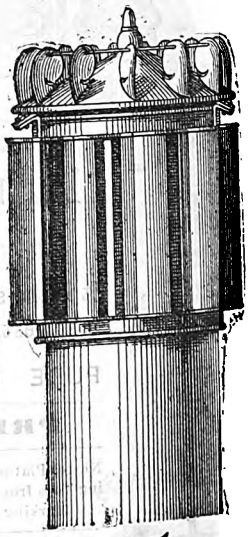

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STOVE PIPE IN 6 FT LENGTHS

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10½ and 33½

5½ and 32½

3 and 37

11½ and 39

15½

6½

16½

21

16½

5 and 37½

15½

89½

91½

42 and 78½

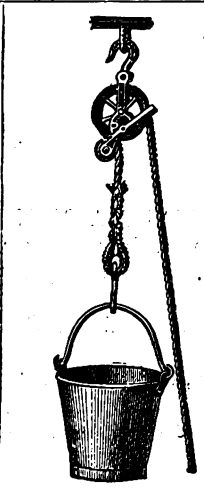
67½

42

91

90½

86


87⅞

86½

75⅝

109

87⅞

86½

43½

104½

66 and 78

49

154

76½

79 to 80½

76

153

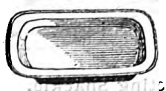
150

157

158

157

150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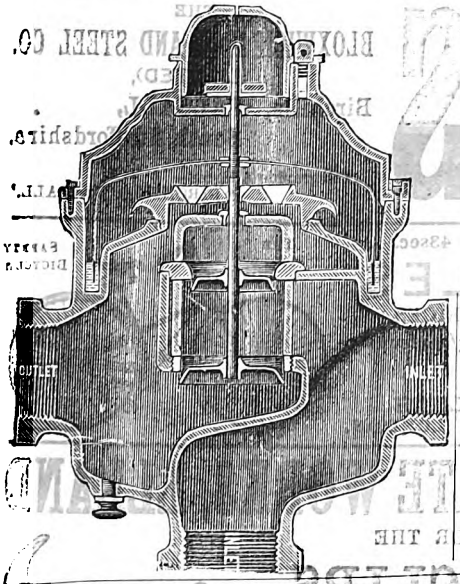

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Has no equal for SIMPLICITY, EFFICIENCY, and DURABILITY

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„ 4, „ 8 „	.. ..	22	6		

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"Practical Hints on Gas Consumption," free on receipt of business card and stamp for postage.

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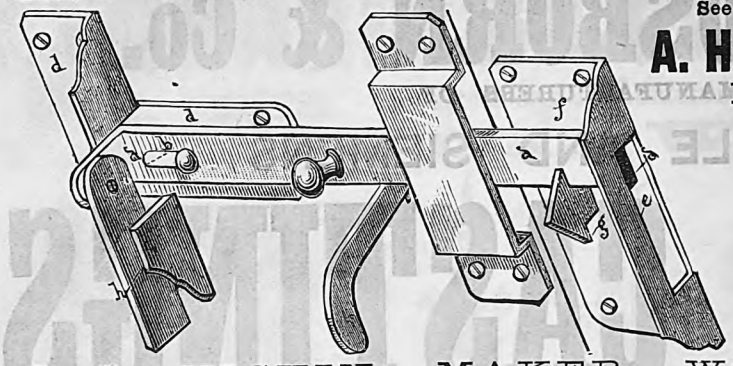
BEST COMBINED LATCH AND BOLT IN THE MARKET.

See what "THE IRONMONGER" says.



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LATCHES and BOLTS.

COMBINED SUFFOLK LATCH AND BOLT.

MR. ALLAN H. BREMNER, Thurso, N.B., has designed and patented a latch which entirely dispenses with the use of a tower bolt or lock upon a back or garden door. This object is attained by providing a slot in the bolt *a*, and a finger-piece *h*, so that by lifting the latter and sliding along the bolt into the opening *e*, in the plate *f*, the bolt cannot be withdrawn or raised from the outside. The invention appears to be thoroughly practicable, and we imagine will find favour wherever introduced.

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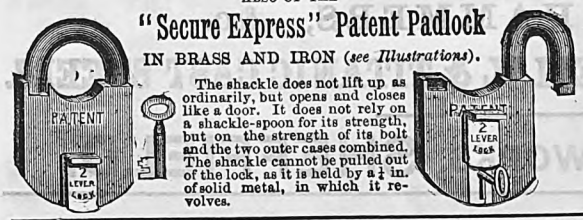
ALSO OF THE

"Secure Express" Patent Padlock

IN BRASS AND IRON (*see Illustrations*).



The shackle does not lift up as ordinarily, but opens and closes like a door. It does not rely on a shackle-spoon for its strength, but on the strength of its bolt and the two outer cases combined. The shackle cannot be pulled out of the lock, as it is held by a ¼ in. of solid metal, in which it revolves.

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GAS, WATER & STEAM TUBES AND FITTINGS.

Whitworth's Standard Threads

EVERY TUBE TESTED.

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South Staffordshire.

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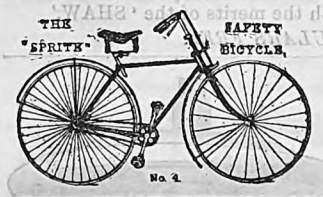

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QUALITY HIGH. REASONABLE PRICES.

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WE ARE SPECIAL AGENTS FOR THE

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Would call the special attention of IRONMONGERS and CUTLERS to their Improved
HORSE CLIPPER SHARPENERS
For regrinding and polishing the worn, blunt, and useless sections, and make them cut again equal to new; this is the only Machine in the market that will make a perfect job of the work.
MADE EITHER FOR FOOT OR POWER.
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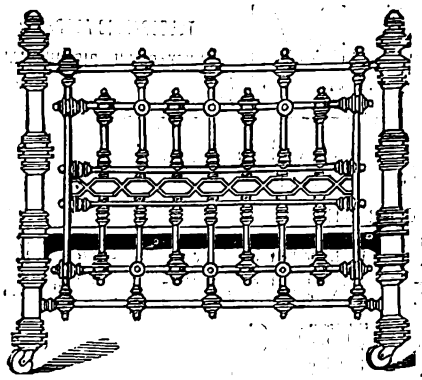

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Highfields Works,
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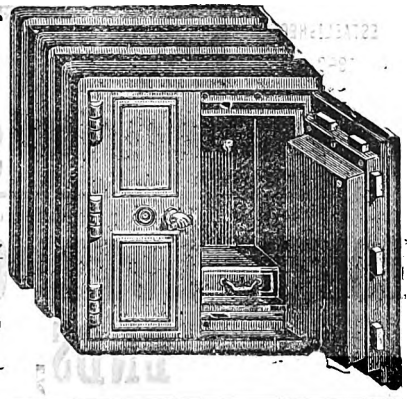
MAKERS OF
FIRE AND THIEF RESISTING SAFES.
DOORS, AND STRONG-ROOMS.
ALSO MAKERS OF
BRASS & IRON BEDSTEADS,
Of all descriptions, for Home and Export.
Lists on application. *Established* 1806.



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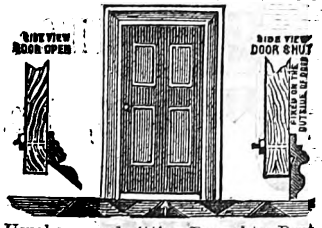

Usual space admitting Draughts, Dust, and Rain.

DRAUGHT, DUST, & RAIN STOPPER.
As used by the Nobility and Gentry everywhere.
FOR THE BOTTOM OF DOORS.
IS SELF LIFTING AND CLOSING. A MARVEL OF SIMPLICITY, EFFICIENCY, AND DURABILITY.
May be had from First-class Ironmongers, Furnishers, &c.
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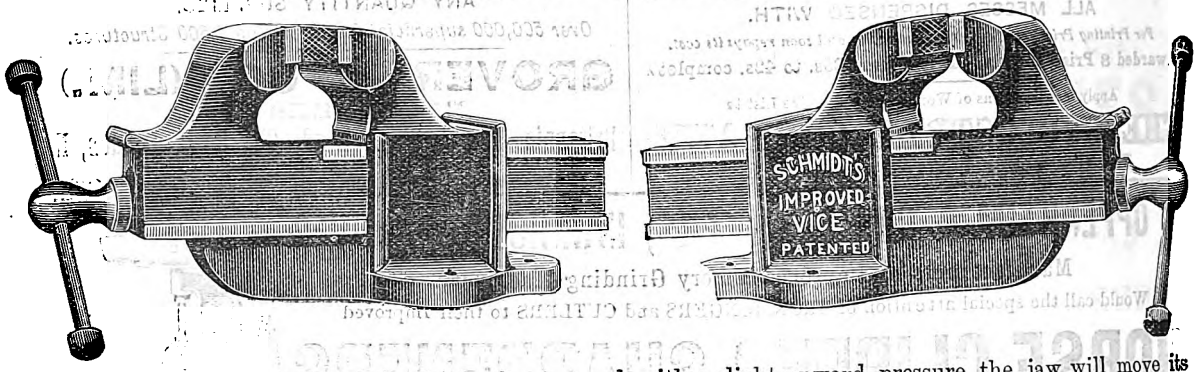
Patents applied for in all Countries.



To use the Vice take hold of the knob of screw, and with a slight upward pressure the jaw will move its entire length of travel, or any portion of same as required. Or the jaw can be opened its full length of travel or part of same by use of screw only.

THE SIMPLE, SOLID CONSTRUCTION, COMBINED WITH QUICKNESS AND ECONOMY, ARE ADVANTAGES WHICH PLACE IT FAR IN ADVANCE OF THE ORDINARY VICE.

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ESTABLISHED 1840.

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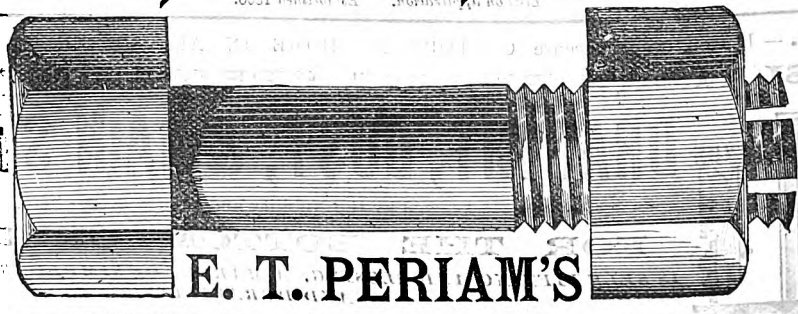
BOLTS, NUTS, COACH SCREWS, SCREWS, BOLT ENDS, TIE RODS, WASHERS.

STEEL FROST STUDS.



GALVANISED ROOFING BOLTS, Etc.

E. T. PERIAM'S PATENT LOCK BOLTS.

500 TONS IN STOCK.

ILLUSTRATED SHEETS. ETC. ON APPLICATION.

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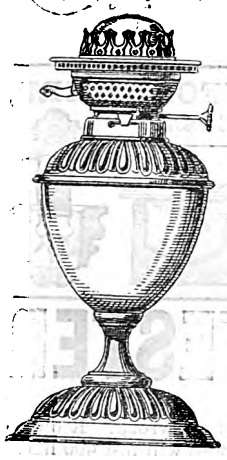

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Lamps giving

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With

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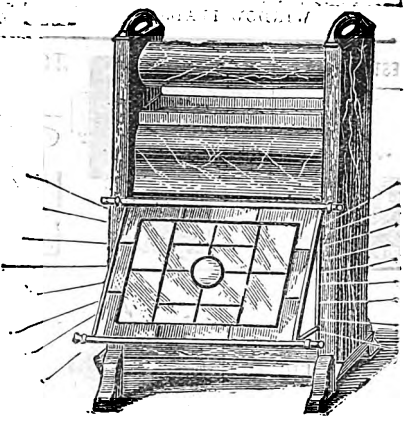

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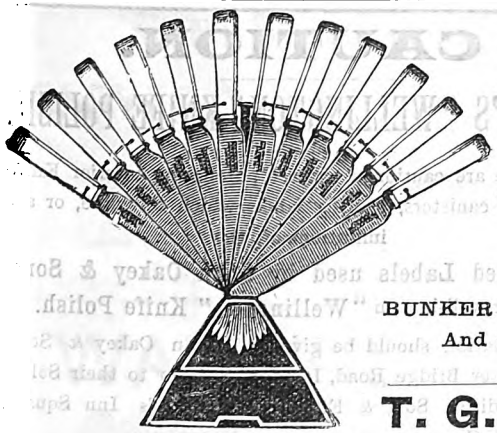

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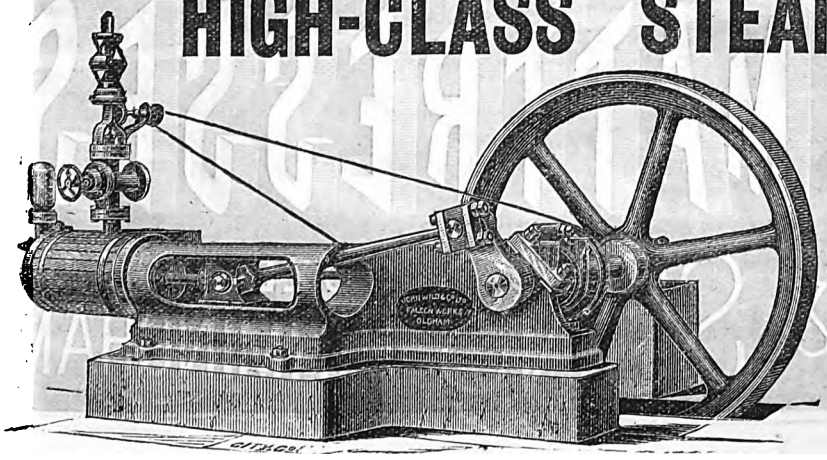

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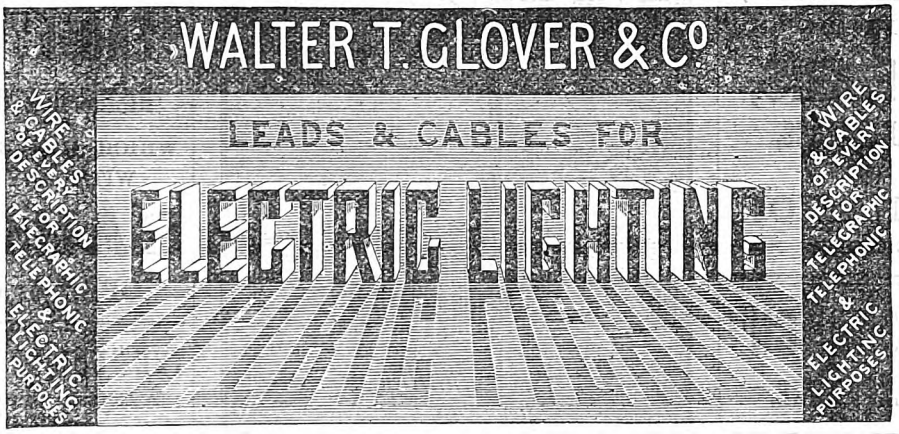
MANUFACTURERS (By Patent Process) OF Silk and Cotton Covered WIRE TAPE and CABLES, of all Sizes, for Electrical Purposes.



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For LEADING-IN, TUNNEL, and UNDERGROUND WORK.

THOROUGHLY INSULATED ANTI-INDUCTION TELEPHONE CABLES UP TO TWO HUNDRED WIRES.

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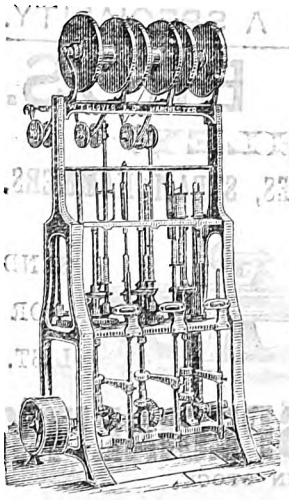

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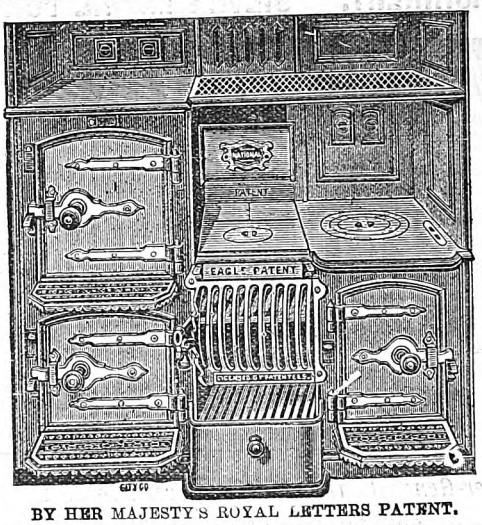

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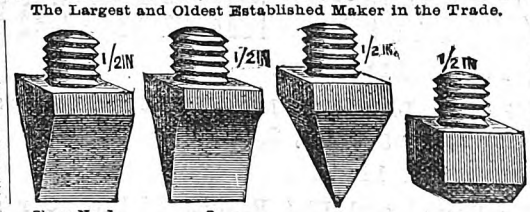

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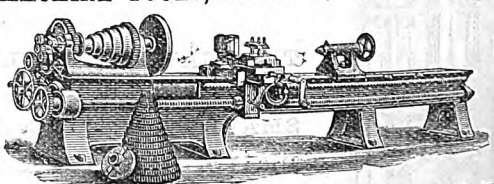

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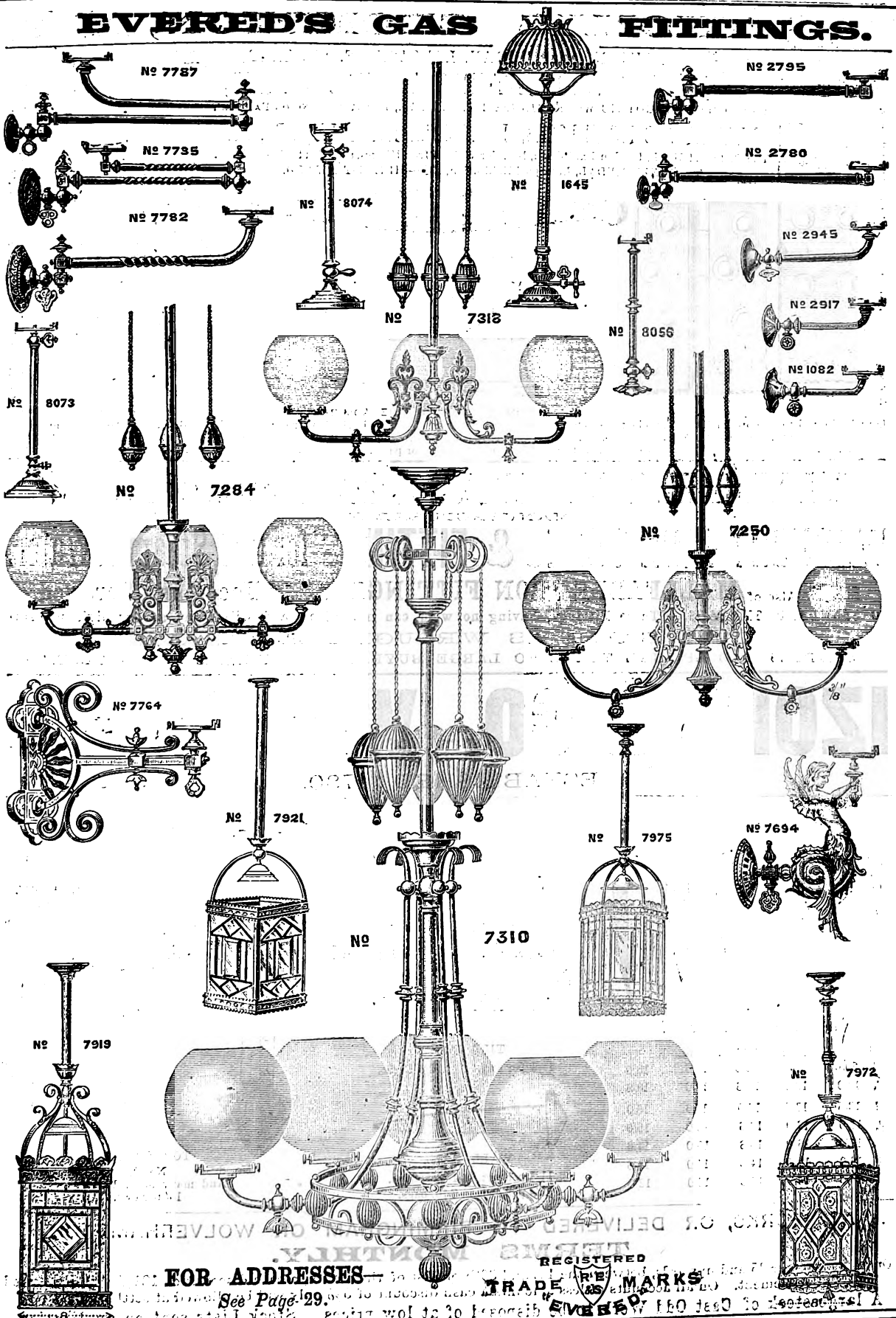

FOR ADDRESSES—
See Page 29.

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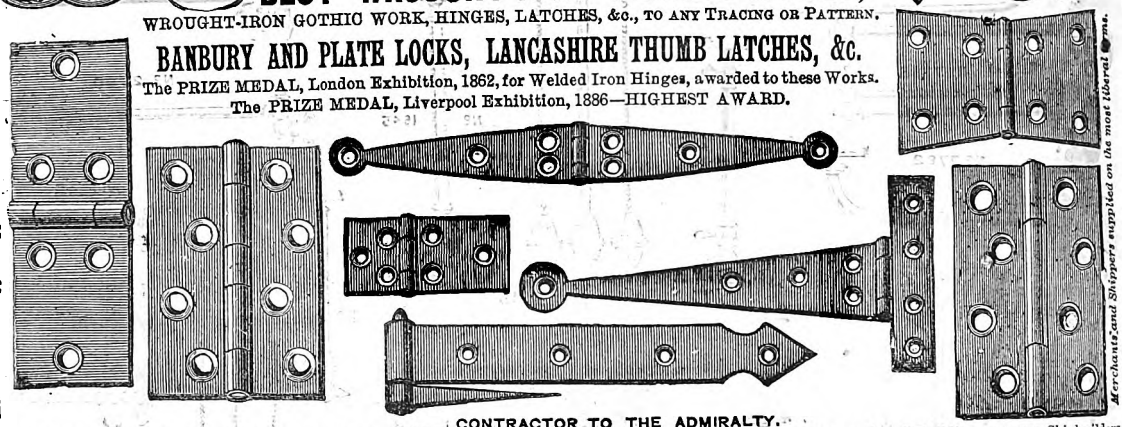

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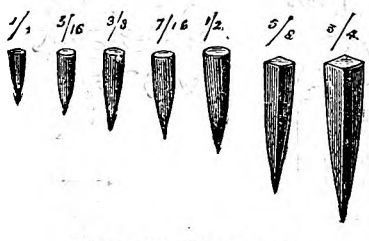

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¼	20/6	19/6	19/0	18/6	18/0
5/16	19/0	18/0	17/6	17/0	16/6
⅜	18/6	17,6	17/0	16/6	16/0
7/16	18/0	17/0	16/6	16/0	15/6
½	17/0	16/0	15/6	15/0	14/6
⅝	16/0	15/0	14/6	14/0	13/6
¾	15/0	14/0	13/6	13/0	12/6

SHOE ANVIL. Old Pattern. 9/6 per cwt.

DOUBLE FEET. 0 1 2 9/6 per cwt.

SHOE ANVIL. New Pattern. 9/6 per cwt.

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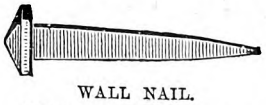

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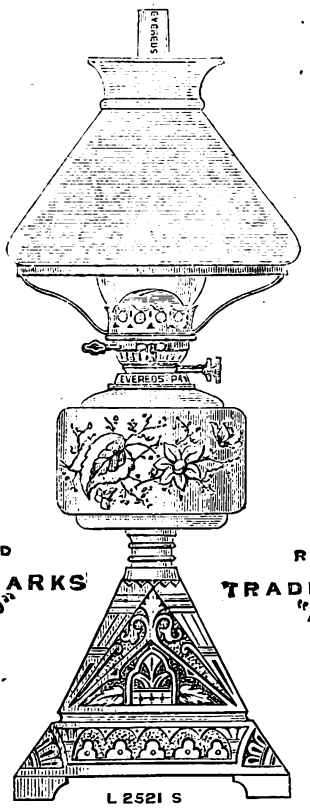
L 716

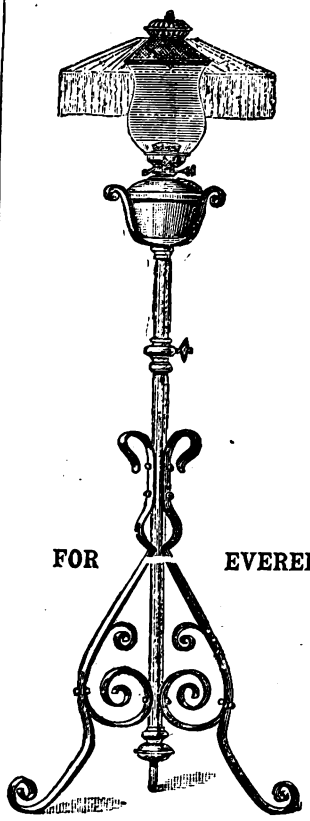


L 2521 S

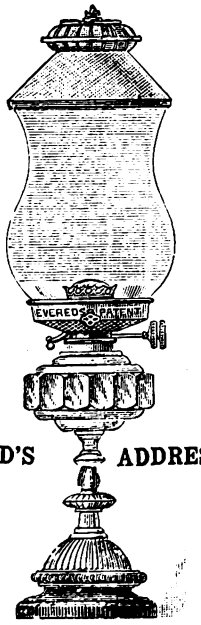
L.710

PUNKAH LAMPS

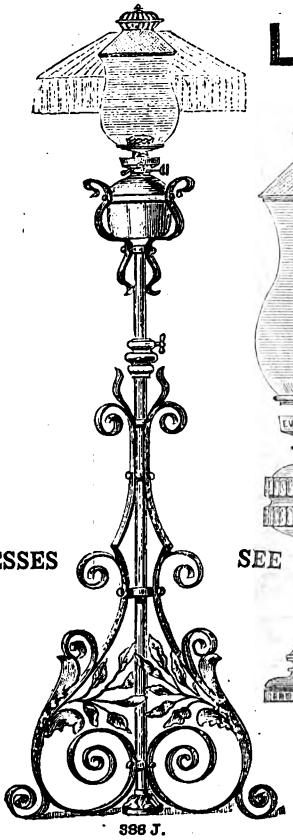
FOR INDIA.



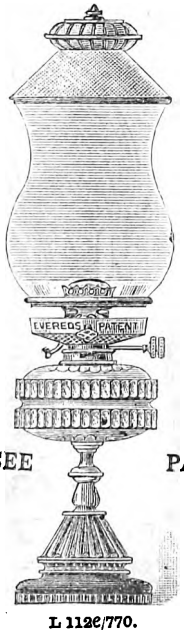
434 J.



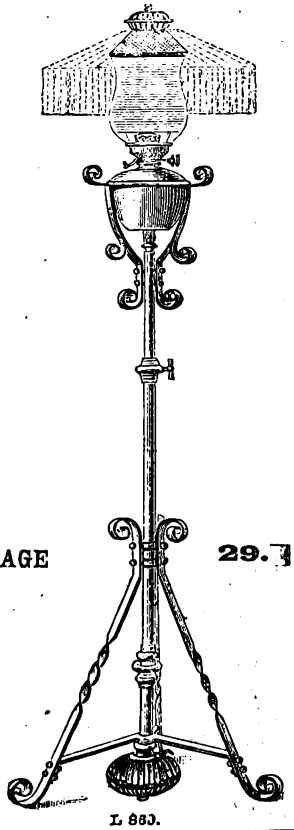
L 1125/735.



388 J.



L 1126/770.



L 883.

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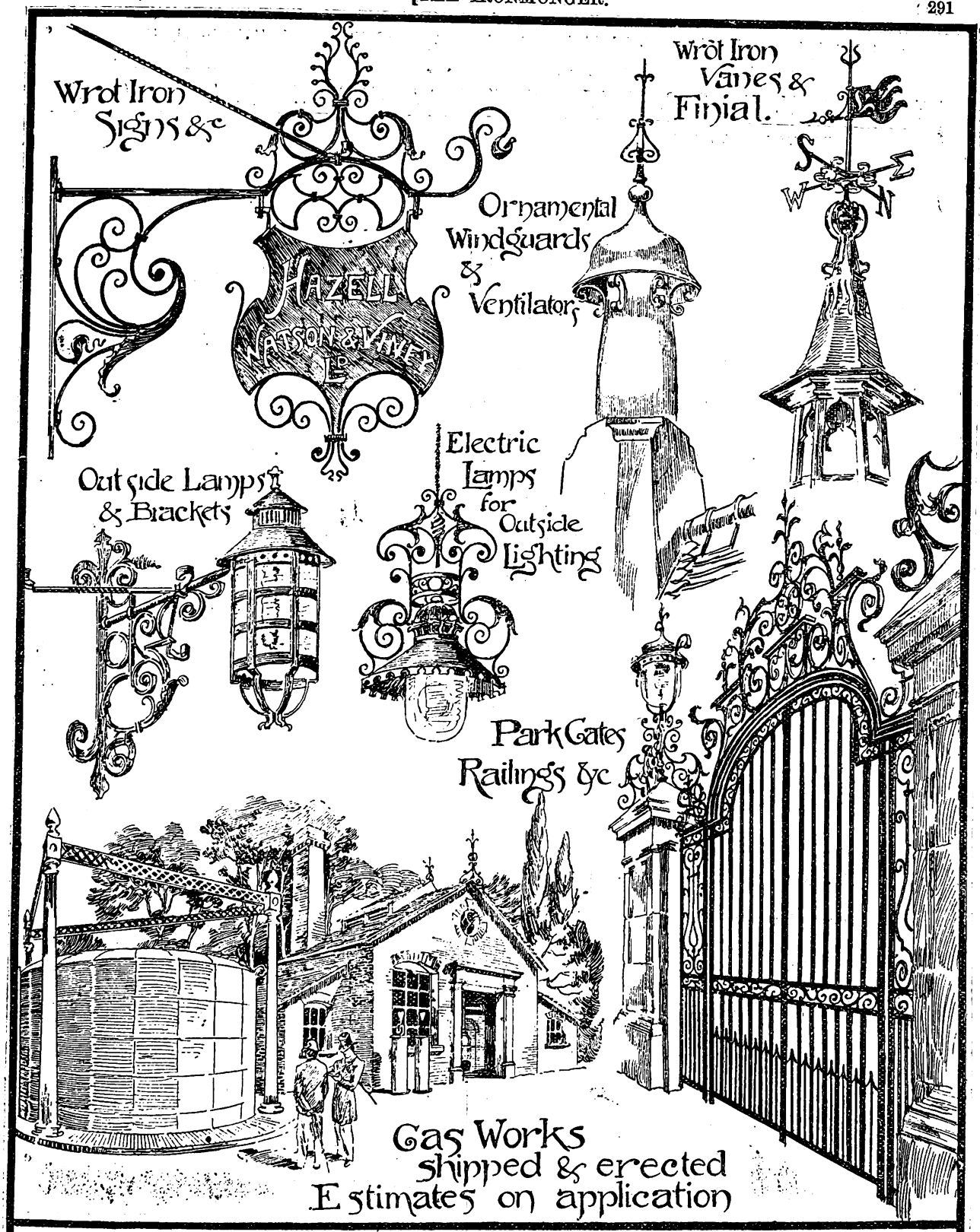

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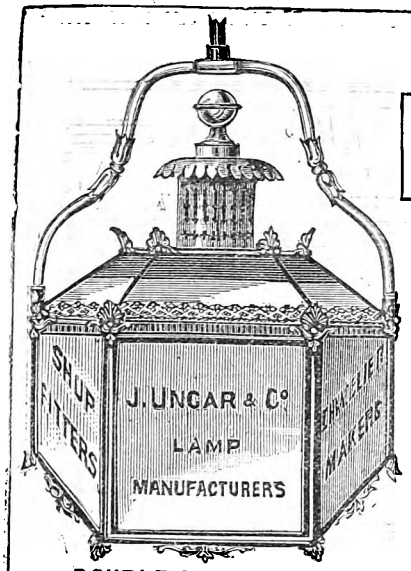
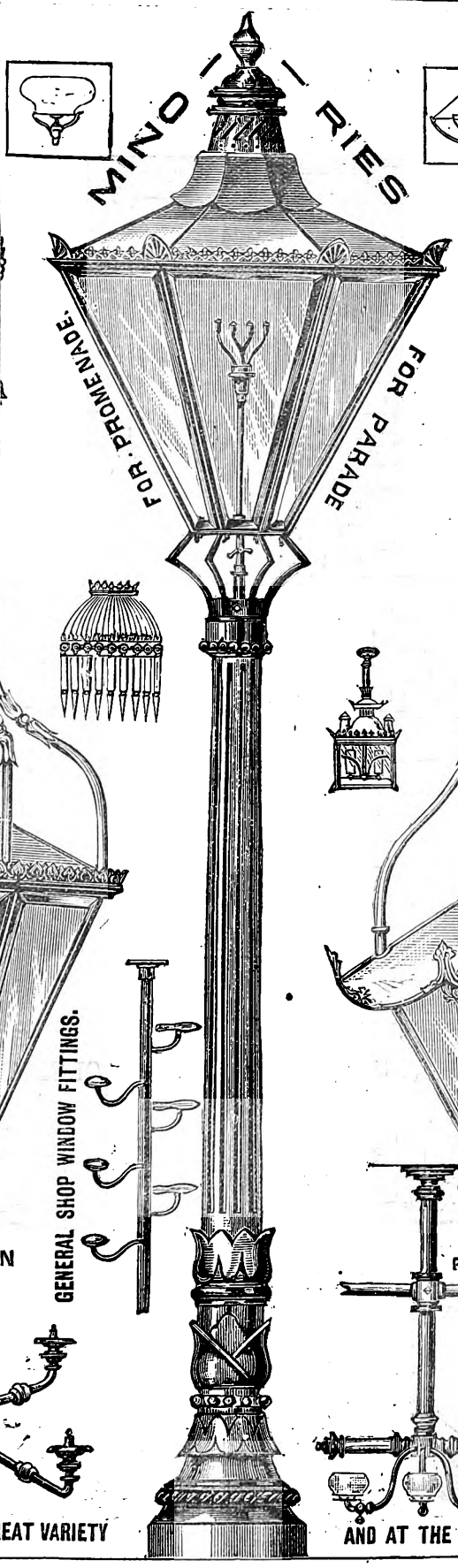
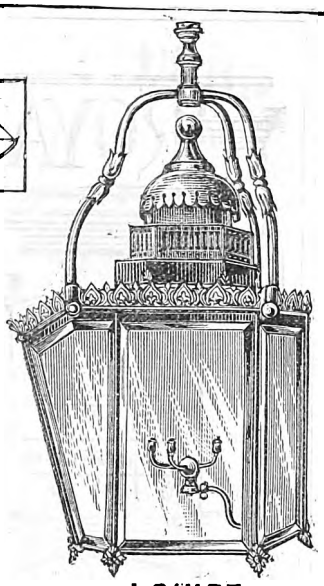


DOUBLE ARM ECLIPSE





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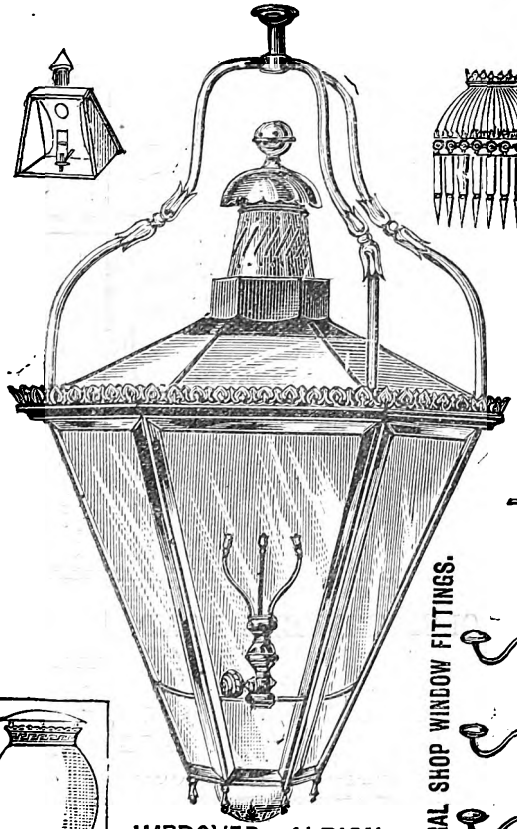

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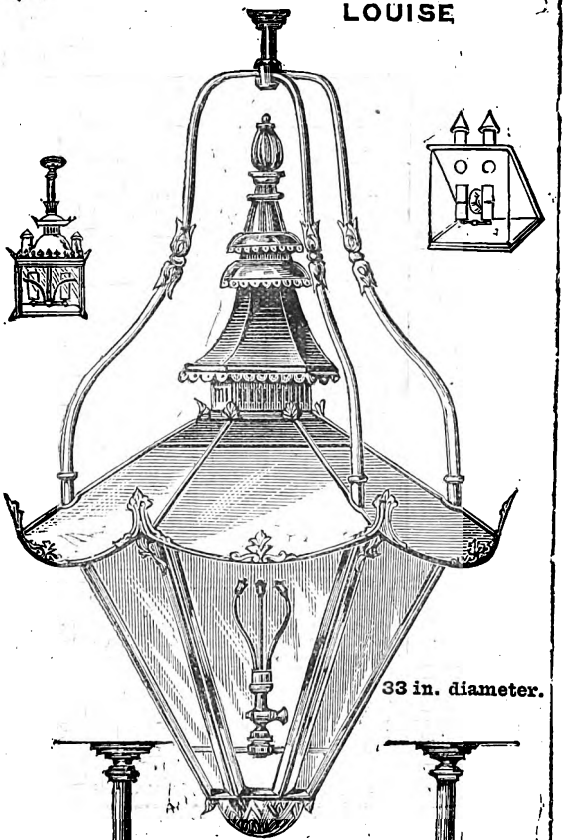

33 in. diameter.

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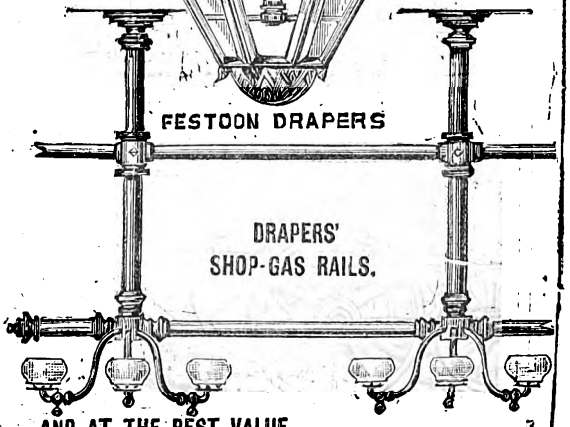
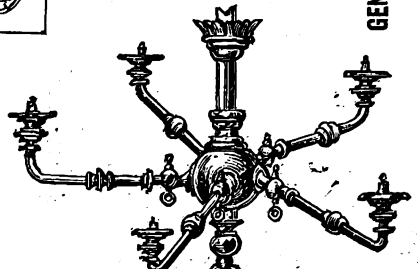


DRAPERS' SHOP-GAS RAILS.



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With Lifting Arrangement for Lighting and Extinguishing.

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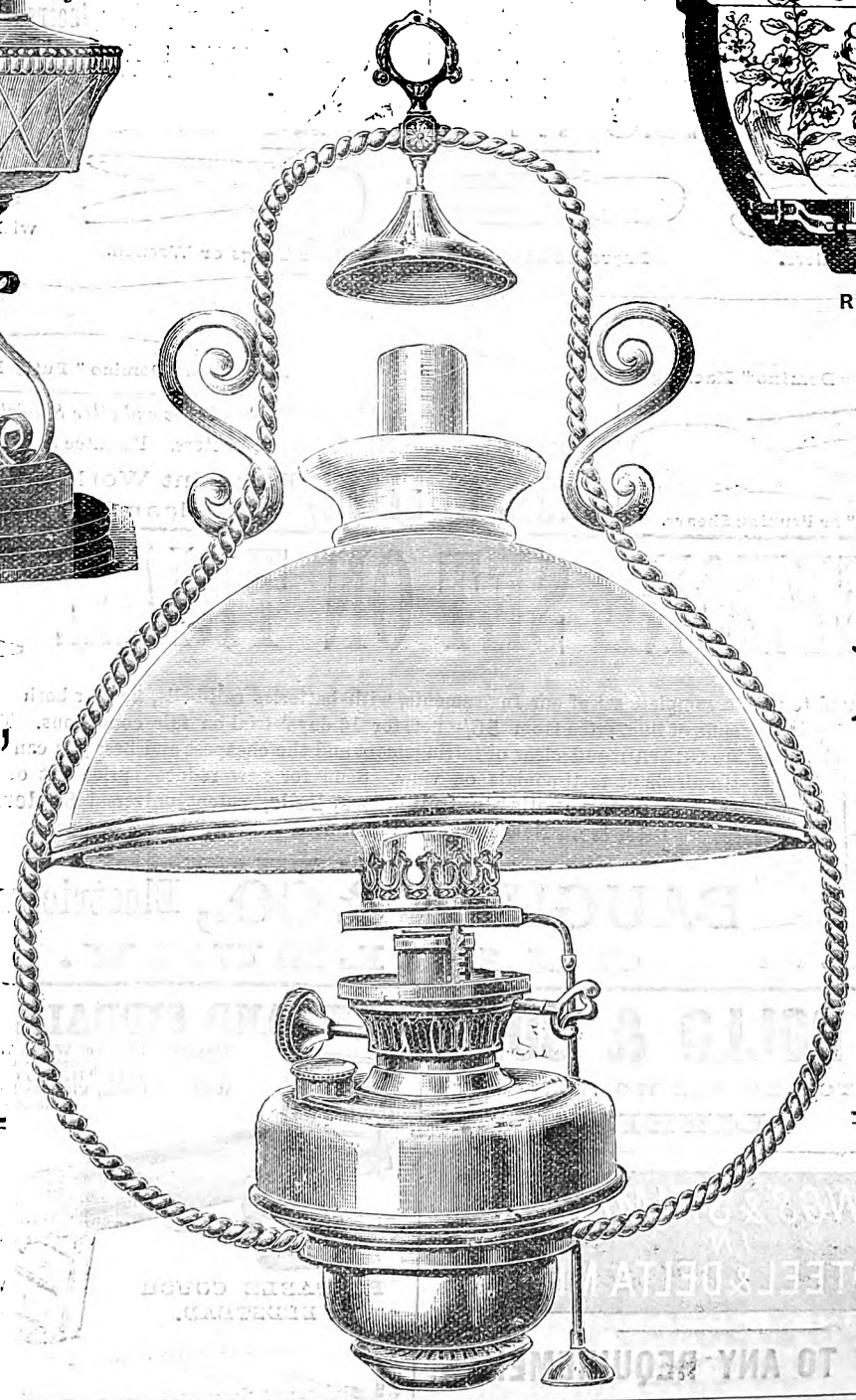

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Lamps of all kinds, **Globes, Chimneys** &c.

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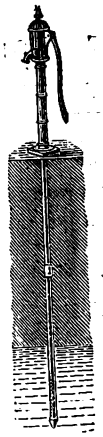

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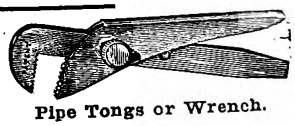

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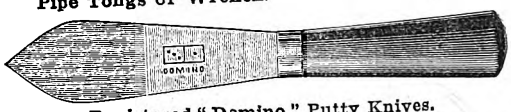
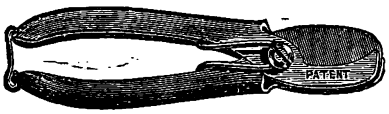


Registered "Domino" Putty Knives.



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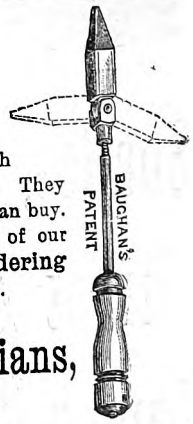

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FORGINGS & STAMPINGS IN IRON, STEEL & DELTA METAL

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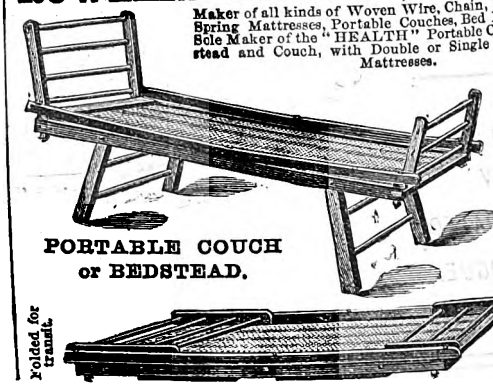
ROWLAND SIDDALL, Dewsbury

Maker of all kinds of Woven Wire, Chain, and Diamond **Spring** Mattresses, Portable Couches, Bed Rests, &c., &c. **Sole Maker** of the "HEALTH" Portable Combined Bed-**stead** and Couch, with Double or Single Woven Wire Mattresses.



PORTABLE COUCH or BEDSTEAD.

Folded for transit.

Cheap, clean, comfortable, elegant. The most comfortable, portable, and convenient Bedstead made.

Specially suited for Hot Climates, and any temporary purpose. Sent carriage paid by Parcels Post, 4ft. 6in. long, 2ft. wide, 14 lbs. weight, 25s. each piece.

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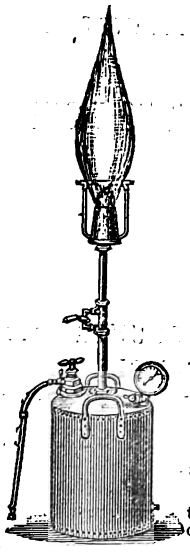
THE PATENT PORTABLE "PHOTOGENE" LIGHT

THE MOST POWERFUL PORTABLE OIL LIGHT IN THE MARKET.



Adopted by the British Admiralty and by large numbers of the most eminent firms in the kingdom.

No special oil required. Will burn blast-furnace and tar oils costing from 1¼*d.* to 2½*d.* per gallon. Will also burn ordinary paraffin or petroleum oils. No spare burners required.

Cheapest in first cost, and cheapest and easiest to use. No steam or compressed air required. Guaranteed to require less attention than any other similar Light in the market.

When ordering through Agents or Merchants it is of the *utmost importance* that the **TITLE** of the Light be specified, viz.:

THE "PHOTOGENE"

and not simply the maker's name.

The "Photogene" can be arranged to burn vertically, horizontally, or at an angle at will. No other Light in the market is so adaptable.

Sole London Agents—

WM. REID & CO., 112 Fenchurch St., E.C.

Sole Maker and Patentee—

WM. WELLS, 50 Commercial St., Leith, N.B.

NO OTHER POSTAL ADDRESS.

TOOLS FOR AMATEURS

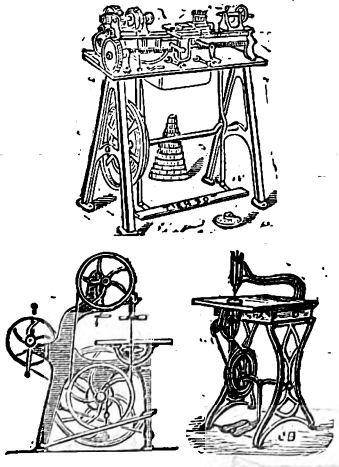
AND MANUFACTURERS.

Special Supplies for FRET SAWING.

TIERSOT, Patent Manufacturer, PARIS,

16 RUE DES GRAVILLIERS.

FIRST PRIZE MEDALS AND 4 DIPLOMAS OF HONOUR.

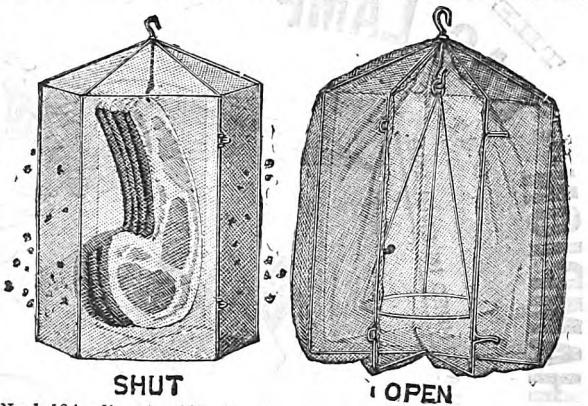


25 FIRST PRIZE MEDALS AND 4 DIPLOMAS OF HONOUR.

Manufacturer of Small Mechanical Saws, working by foot, hand, or machine power. All kinds of Lathes. Saws of all Nos. and Lengths. All kinds of Tools. Publisher of Designs for Fret Sawing—The Tour Eiffel, Sculpture Marquetry. More than 2,000 sheets to select from.

The Tariff Album (230 pages & more than 600 engravings) post free for 6½*d*

PEARSE'S PATENT HANGING MEAT SAFES



No. 1, 16 in. diameter, 19 in. length. No. 2, 18 in. diameter, 23 in. length
Are made of strong wire, covered with Mosquito net. Durable, inexpensive and so made that flies and insects cannot enter. Retailed at 1/6 and 2/-

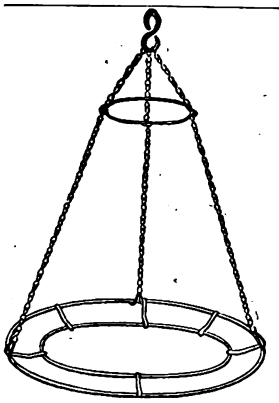


PLATE SUSPENDERS

(REGISTERED).

Two sizes. Made of stout wire, suspended by a chain; cannot be upset, and are capable of holding large joints.

Retailed at 1/6 and 2/ each.

A cheap form of the same sold at only a few pence.

PEARSE'S PATENT

FOLDING MEAT COVERS

Are superior to wire covers for cleanliness, cheapness, and portability
All the above can be folded flat when not in use. 12 in. /6, 14 in. /9
16 in. 1/, 18 in. 1/3, 20 in. 1/6.

PEARSE'S ORIGINAL

MEAT SAFE OR FLY CHEAT

(COMPLETE WITH HOOK).

Can be obtained with wire or cane frame, and are the cheapest and best in the market.

Any Size Manufactured. *Quotations on application.*

LIBERAL TERMS TO SHIPPERS AND THE TRADE.

JAMES PEARSE & COMPANY,

SOLE MANUFACTURERS,

170 & 171 FORE ST. EXETER.

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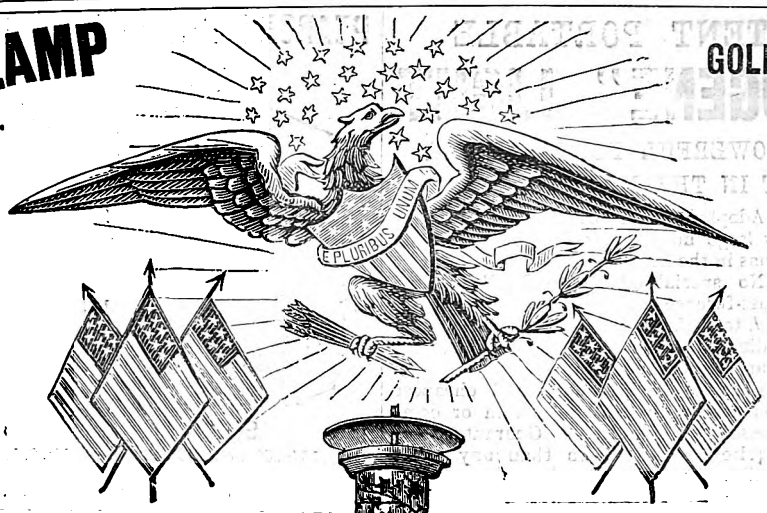
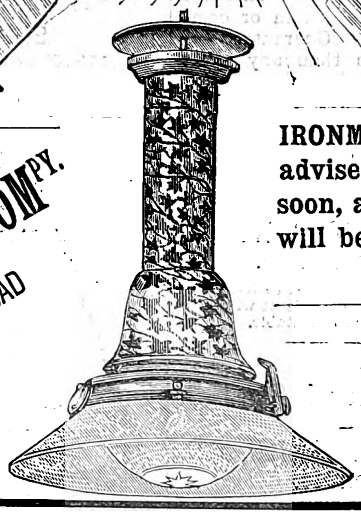
THE "CHAMPION" GAS LAMP (PATENT).

MANUFACTURED IN ENGLAND.



GOLD AND SILVER MEDALS, and other DISTINCTIONS AT EXHIBITIONS.

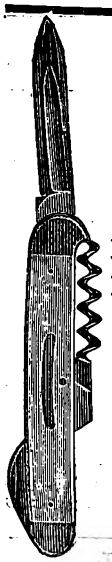


IRONMONGERS in the COUNTRY are advised to order a SAMPLE LAMP soon, as the "CHAMPION" will be THE LAMP OF THE SEASON, commencing now.

Some simplifications in the construction place the "CHAMPION" LAMPS beyond all competition.

PRICE LIST ON APPLICATION.

Sole Manufacturers:
THE
CHAMPION GAS LAMP COMPY.
37 SOUTHWARK BRIDGE ROAD
LONDON.



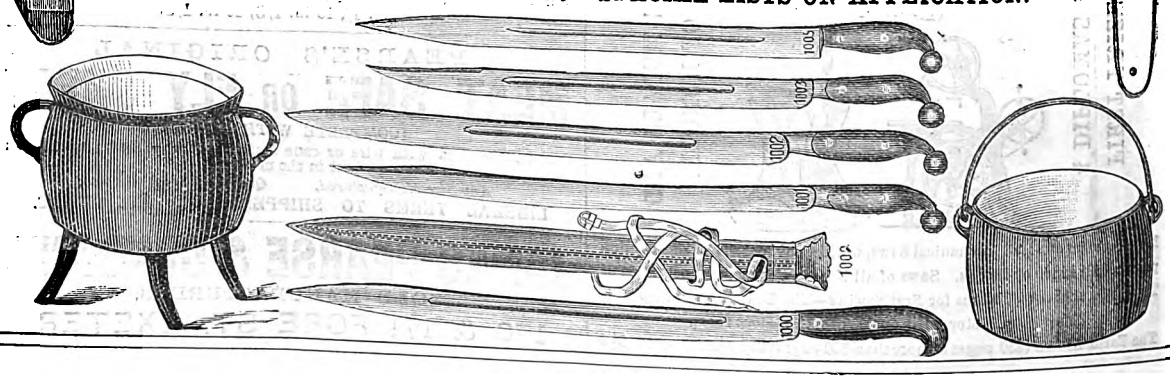
FRED. BARTON & CO.

37 Southwark Bridge Rd., LONDON,

Representing the Largest Continental Works of ENAMELLED HOLLOW-WARE, TOOLS, CUTLERY, AGRICULTURAL IMPLEMENTS, CARTRIDGES, ICE MACHINES, and every description of HARDWARE.

Buyers are invited to inspect the Showrooms at above address.

CORRESPONDENCE SOLICITED. SPECIAL LISTS ON APPLICATION.



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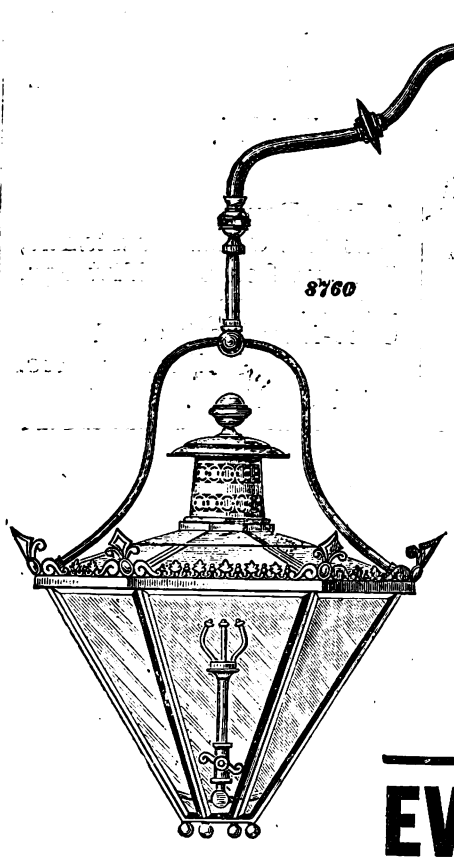
FOR EVERED & COMPANY'S ADDRESSES SEE PAGE 29.



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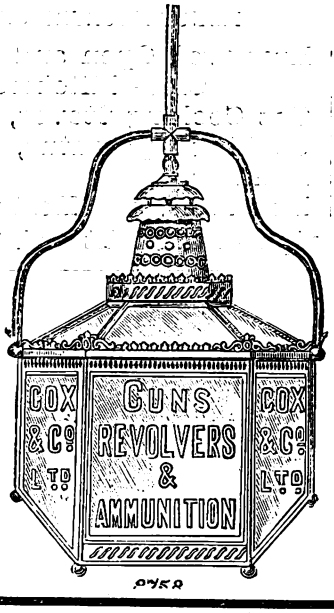

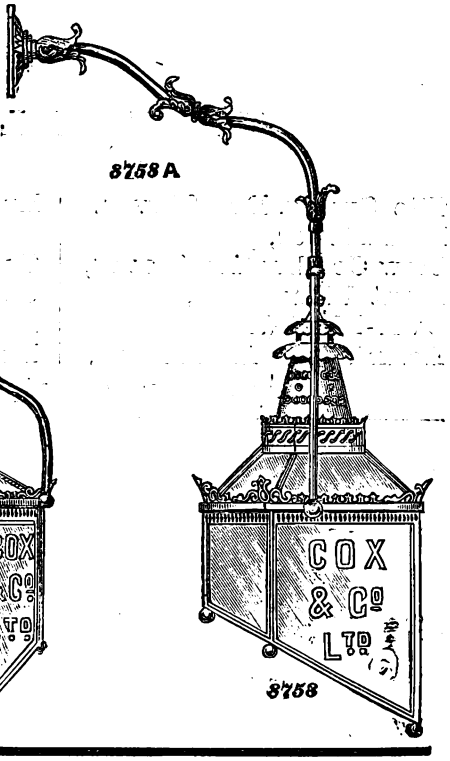

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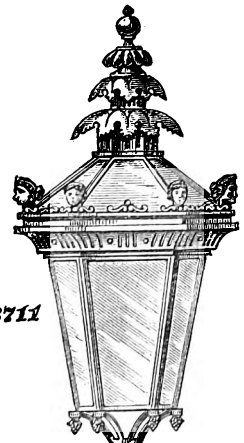
EVERED & COMPY., LTD.

LONDON AND BIRMINGHAM,

REGISTERED TRADE MARKS "EVERED"

Manufacturers of	STREET	LAMPS.
,, ,,	BRACKET	LAMPS.
,, ,,	LOBBY	LAMPS.
,, ,,	PUBLIC-HOUSE	LAMPS.
,, ,,	SHOP	LAMPS.
,, ,,	OFFICE	LAMPS.
,, ,,	CHURCH	LAMPS.
,, ,,	REFUGE	LAMPS.



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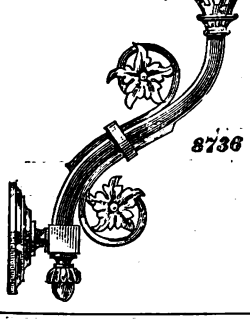

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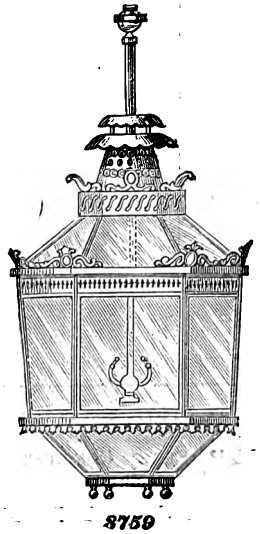

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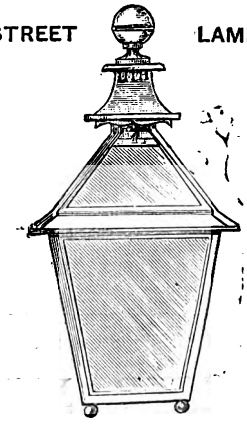
STREET LAMP



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DECORATIVE ART TILES.

TESSELATED AND ENCAUSTIC TILE PAVEMENTS.

MOULDED SKIRTING, SURBASE & ANGLE TILES FOR WALLS AND DADOS.

ENAMELLED TILE FENDERS.

GLAISED HEARTH AND PANEL TILES.

WHITE & PLAIN GLAISED, ENAMELLED, EMBOSSED, PRINTED, And DECORATED TILES.

Catalogues on Application.

GEORGE WOOLLISCROFT & SON,

Postal Address: HANLEY, ENGLAND.

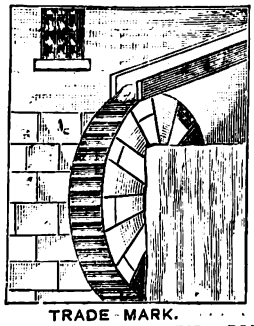
WORKS: HANLEY, ETRURIA, & CHESTERTON,

NORTH STAFFORDSHIRE.

52 Finsbury Pavement, LONDON, E.C.; 89 Woodhouse Lane, LEEDS.

"Etruria Hydraulic" Tiles

Sound, Straight,



Cheap, and Good.

TRADE MARK.

FOR FLOORS AND WALLS.

PATENT MACHINERY FOR ROOFING TILES.

IRON PAVING, STABLE, and CLINKER BRICKS.

Staffordshire Quarries.

NEW AND SPECIAL MAKE OF

MALTING TILES.

ROOFING AND FLOORING TILES.

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JONES & CAMPBELL,

Torwood Foundry, LARBERT, SCOTLAND.

Makers of STOVES, RANGES, and LIGHT CASTINGS for COLONIAL USERS.

CHEAP.

EXCELLENT.

QUICK DELIVERY

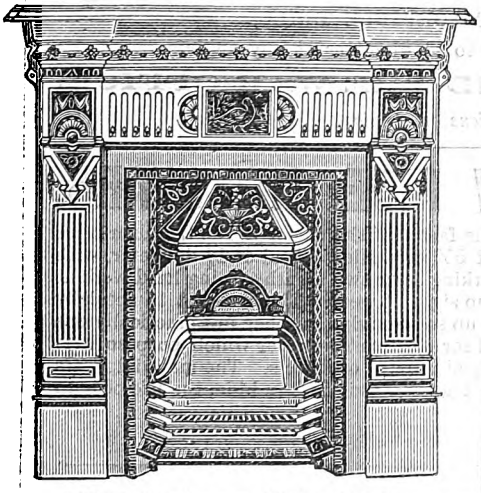
CHEAP LEADING LINES.
PORTABLE RANGES.
WARMING STOVES.
LAUNDRY STOVES.
SELF-SETTING RANGES.
BUILDING RANGES.

REDUCED PRICES.

NEW LISTS.

SHARP DELIVERIES

THE "SURPRISE" MANTEL REGISTER
(DESIGN REGISTERED)

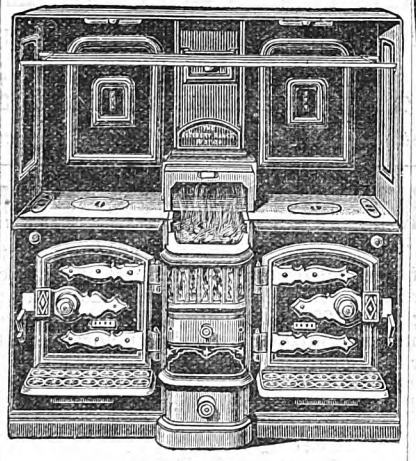


Size 36 in. × 46 in. high.

Painted in Black, White, Pale Green, or Blue, 27/6 each.

"Surprise" Shams, 24/ each.

THE "ROSEBERY" KITCHENER.



Fire—10 inches.

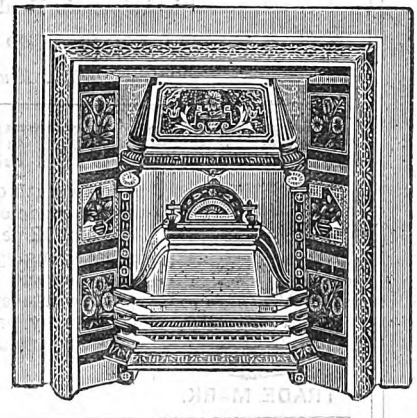
Sizes, 30 32 34 36 38 40 42×25×18 ins., with skirting.

Ovens, 14 14 14 14 14 17 17×15×15 ins.

Prices, 66/ 67/ 68/ 69/ 72/ 76/ 80/ each, Oven & Sham. 48 in., 125/; 51 in., 140/; 54 in., 155/ each, with Double Ovens. Covings and Plate Rack 17/6 to 25/ extra; Return Ends, 6/ extra; Jamb Mouldings, 18/ to 30/ extra.

Supplied also as a Building-in Range, with or for all kinds of boilers, in a variety of sizes and styles, ranging from 50/ to 200/ each.

THE "YARRA" STOVE
(With quick fire)
DISTINGUISHED FOR BOLD & ORIGINAL MOULDINGS.
(Registered Design.)



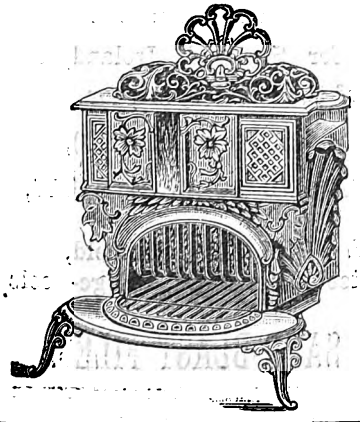
16-inch fire.

Sizes,	34	36	38	40	42 ins.
Prices,	15/9	15/9	16/3	16/9	17/3 each, fine cast for Tiles.

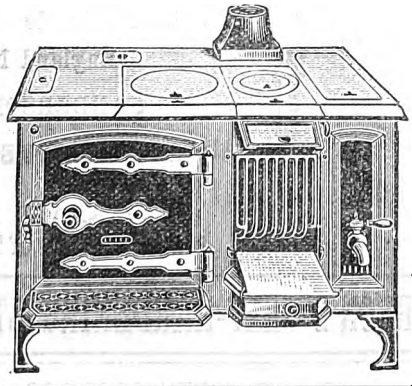
Ground and B.B. .. .. .. 7/ extra.
Second Finish .. .. .. 12/ „
First „ .. .. .. 15/ „

Tiles extra; Bronzed Panels and Canopy 40/ extra; Fire Frets 1/3 to 3/6 each extra.
SHAMS, 3/6 less.

POPULAR COOKING AND HEATING STOVES.



THE "TORWOOD" RANGE
(Portable and Self-Setting.)



Drawings and Prices furnished on application of Tile Stoves, Kerbs, Mantels and Overmantels. General Castings to pattern turned out quickly.

The "ROSEBERY" Ranges and "SURPRISE" Mantels are approved by, and supplied to, the City of Glasgow Corporation for use in the New Industrial Dwellings.

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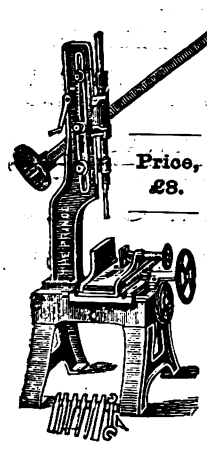
THE MANNESMANN PATENT SOLID STEEL WELDLESS TUBES,

Made from 1 inch to 16 inches diameter, of a thickness from ⅛ in. to one-third the diameter, in Self-hardening Steel, in Crucible Cast Steel, in Siemens Steel, in Phosphor-Bronze, in Delta Metal, in Copper, and in Aluminium.

For prices and particulars apply to **TOM TAYLOR,** 31-35 South Corridor, Royal Exchange, **MANCHESTER.** Wholesale only.

Established 1846. **JOSEPH GREEN & NEPHEW,** Globe Iron Works, **HUNSLET, LEEDS.** Established 1846.

MANUFACTURERS OF ALL KINDS OF WOOD-WORKING MACHINERY.



Price, £8.

The "Prince," Improved Patent Combined Mortising Boring, and Tenoning Machine.

Price (including 1/4, 5/16, 3/8, 1/2, 5/8, and 3/4 best Cast Steel Chisels, 1 Core Driver, 1 Screw Key, and 1 Set Square) £ 8 0 0
Extra for Boring Apparatus, complete with 1/2, 5/8, and 3/4 Round-nosed Augers, and 1/4 and 5/8 Cast Steel Drills ... 1 5 0
Extra for Tenoning Tool, which will cut Tenons from 1/8-in. to 1-in. 2 0 0
Extra if above Machine is fitted with Self-Coring Chisels 13 0

The "Eclipse" Patent Hand Power Combined Circular and Band Sawing Machine.

The Circular Saw has a Rising and Falling Spindle and Self-acting Feed, will cut 4½ in. deep with 14-in. saw. The Band Saw will cut 6-in. stuff with ease, but will admit work 11 in. deep, thus allowing an 11-in. lock-rail to be tenoned.

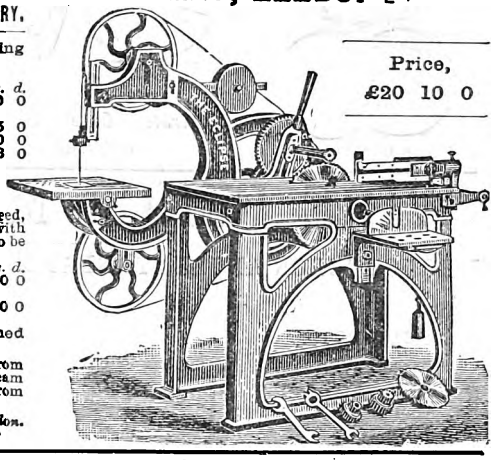
Price, with one each, 9-in. and 14-in. Circular Saws, and one 3/8-in. Band Saw £ 20 10 0
Extra, if fitted with Boring arrangement, with Sliding Fence, and one Round-nosed Auger 2 0 0

All Saws sent out with our Machines are Set and Sharpened ready for immediate use.

Hand Power Mortising Machines, from £8 to £12; Steam Power ditto, from £45 to £55; Hand Power Circular Saw Benches, from £7 to £12; Steam Power do., from £13 to £32; Hand Power Band Sawing Machines, from £8 to £11; Steam Power ditto, from £11 10s. to £60.

Liberal Discounts to the Trade. *Drawings on application.*

Telegraph Address—"GREEN & NEPHEW LEEDS."

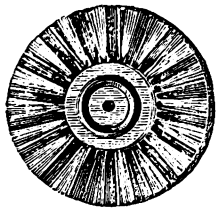


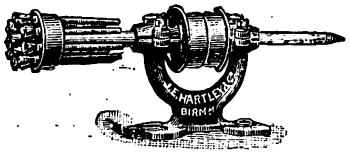
Price, £20 10 0

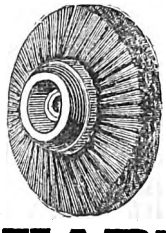
J. E. HARTLEY & CO.

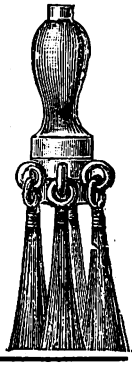
MANUFACTURERS OF

Polishing Lathes, Brushes, Compositions, Bobs, Mops, and all Metal Polishing and Electro-plating Requisites.





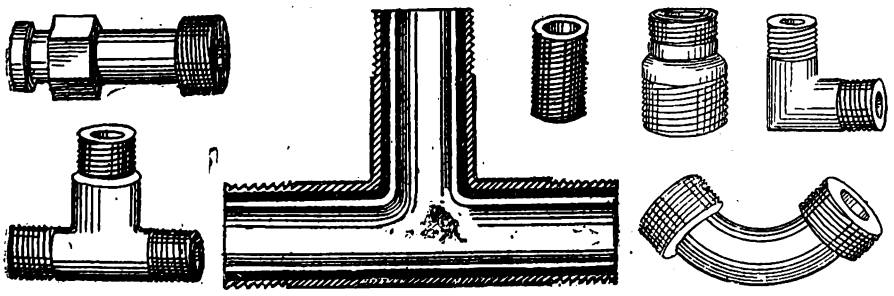




13 SAINT PAUL'S SQUARE,

BIRMINGHAM.

RYLANDS' PATENT GLASS-LINED TUBING



ESPECIALLY ADAPTED FOR

Water Service Pipes, Electric Lighting Mains, Mineral Water Factories, Breweries, Milk Establishments, Laboratories, Chemical Manufactories, and numerous other purposes.

This Tubing can be fixed easily and inexpensively, all the joints of the smaller pipes being provided with a Union Nut, and the larger sizes (say 2 ins. to 4 ins.) with Flanges.

DURABILITY AND PRICE.—It is practically INDESTRUCTIBLE, either by ordinary use or the action of heat or cold, and the cost, jointed and fixed complete, compares favourably with that of ordinary lead piping.

ADDRESS—

RYLANDS' GLASS-LINED TUBING COMPANY, 62 King William St., **LONDON.**

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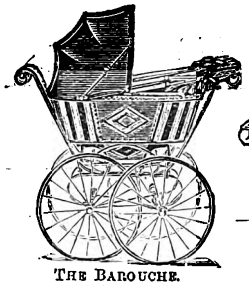
The HALESOWEN PERAMBULATOR & CARRIAGE CO., Lim.

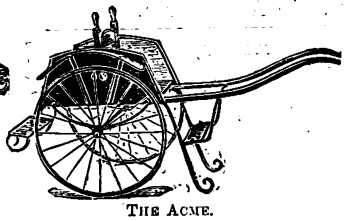
HALESOWEN, near BIRMINGHAM,

Manufacturers of every description of

PERAMBULATOR, BASSINETTE, MAIL CART, &c.



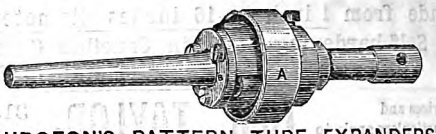
THE BAROUCHE.



THE ACME.

Illustrated Catalogue sent on application.

SPECIALITIES.



DUDGEON'S PATTERN TUBE EXPANDERS.

1⅛ 1⅜ 1⅞ 1⅝ 2 2¼ 2½ 2⅝ 2¾ 3 3¼ 3½ 3⅝ 3¾ 4 in. external diam.

30/ 35/ 36/3 36/3 42/ 50/ 60/ 65/ 70/ 80/ 87/6 87/6 100/ 110/ 110/ 120/ each gross price.

Discount 50 Per Cent.

UPWARDS OF 200 READY FOR DELIVERY.

A. M. WILD, Tool Maker, SHEFFIELD.

28 YEARS IN THE TRADE.

WIRE FENCE MATERIALS FOR EXPORT.

WROUGHT-IRON ANGLE STANDARDS (with or without earth-plates), WROUGHT-IRON DROPPERS.

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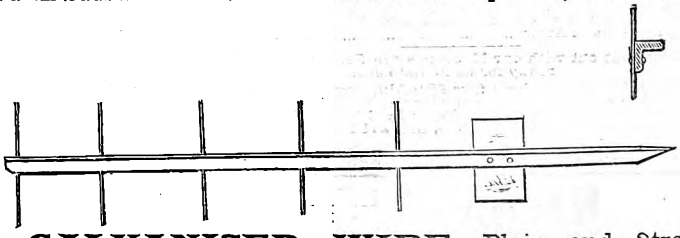

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BLACK and GALVANISED WIRE, Plain and Strand, Iron or Steel.

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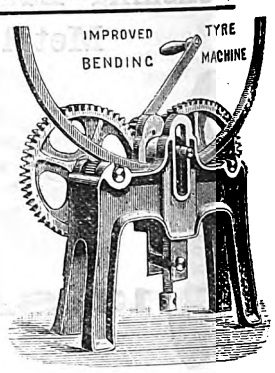

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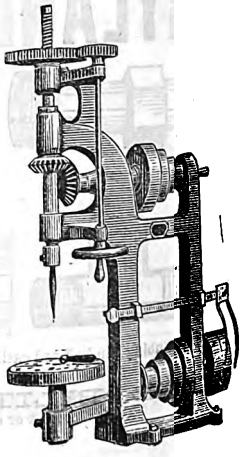

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Specialities: Drilling, Milling, & Slotting Machines.

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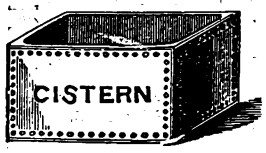

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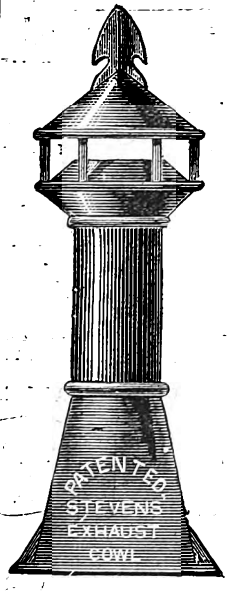

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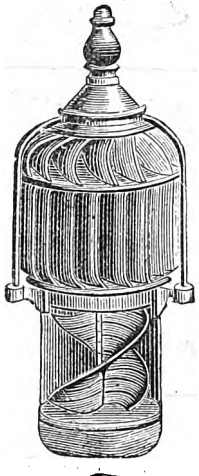
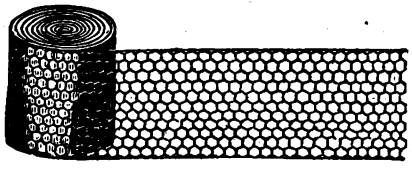
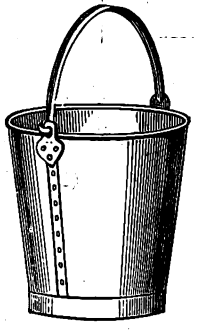
Galvanised Iron and Wire Merchants.



VENTILATORS AND CHIMNEY-TOPS.

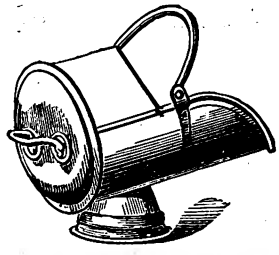


MACHINE-MADE WIRE NETTING.

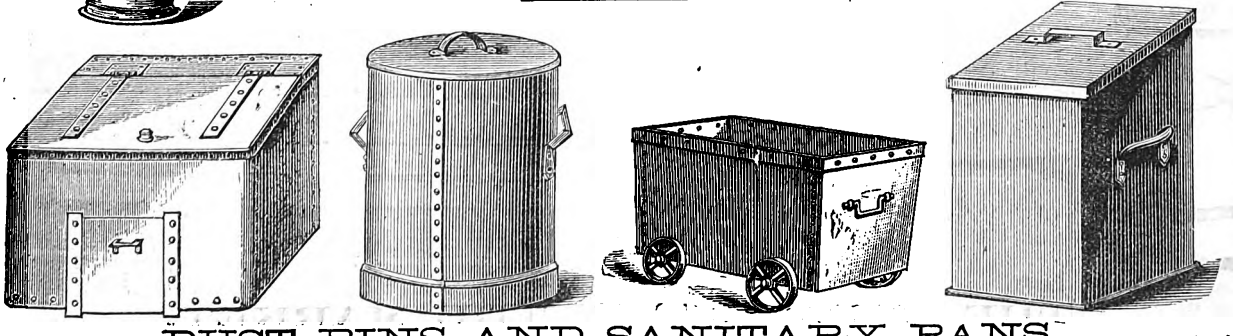


WROUGHT-IRON GALVANISED HOLLOWWARE

OF EVERY DESCRIPTION KEPT IN STOCK.



ELECTRIC BELLS AND FITTINGS.



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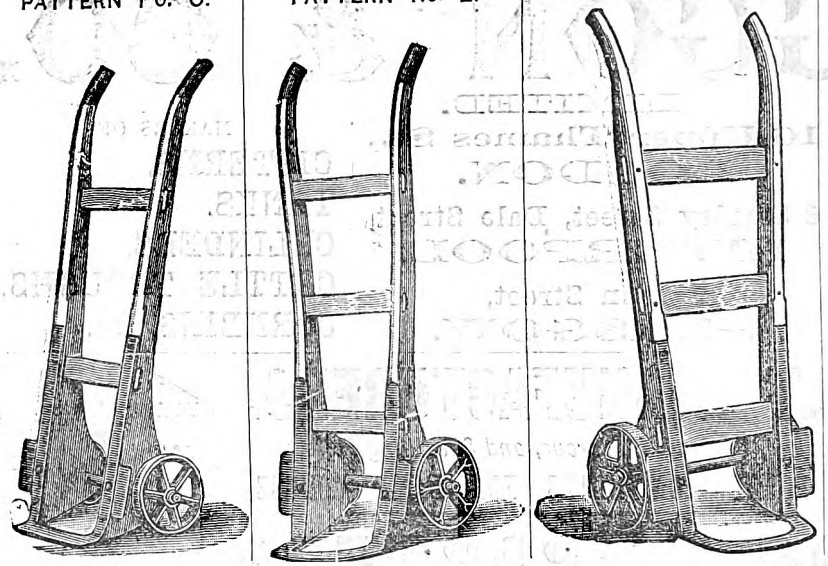
PATTERN No. 0. PATTERN No. 2. PATTERN No. 4.



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With Wrought-iron Mounts and Best Hardwood Frames, Varnished, and well finished in every respect. Terms - 33⅓ % Monthly Account.

No.	Make	Bars	Height	Irons	Whls	Price	Extra for Indiarubber Tyres
							Pair
0	Light	2 Straight	3 ft. 8 in.	Square Set	7 in.	16/6	9/-
1	Medium	3 do.	3 ft. 8 in.	Square Set	8 in.	17/-	10/-
2	Do.	3 Curved	3 ft. 8 in.	Round Set	8 in.	17/6	10/-
3	Do.	do.	4 ft.	Round Set	9 in.	18/-	12/-
4	Strong	3 Straight	4 ft. 3 in.	Round Set	9 in.	19/-	12/-
5	Do.	do.	4 ft. 3 in.	Square Set	9 in.	19/-	12/-
6	Do.	3 Curved	4 ft. 3 in.	Round Set	9 in.	20/-	12/-
7	Do.	do.	4 ft. 3 in.	Square Set	9 in.	21/-	12/-

J. & D. M'PHUN, Saw Mills, Greenhead **GLASGOW.**

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NEAR NETHERTON. DUDLEY.

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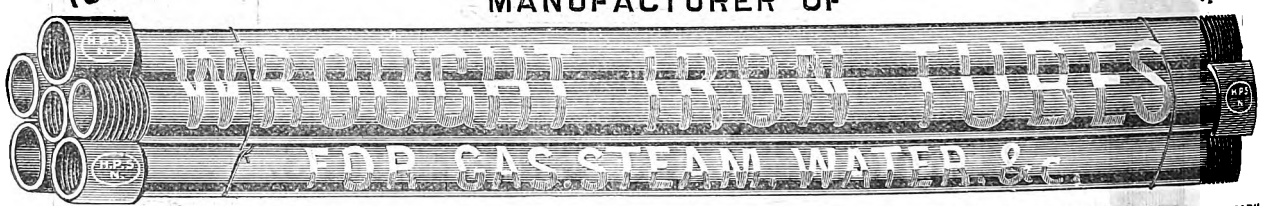

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STEEL TUBES SCREWED AND SOCKETED.
Iron, Brass, and Gun-metal Cocks. Stocks, Taps, Dies, and other Tools.
LAP-WELDED TUBES FOR LOCOMOTIVE AND OTHER BOILERS, ETC.

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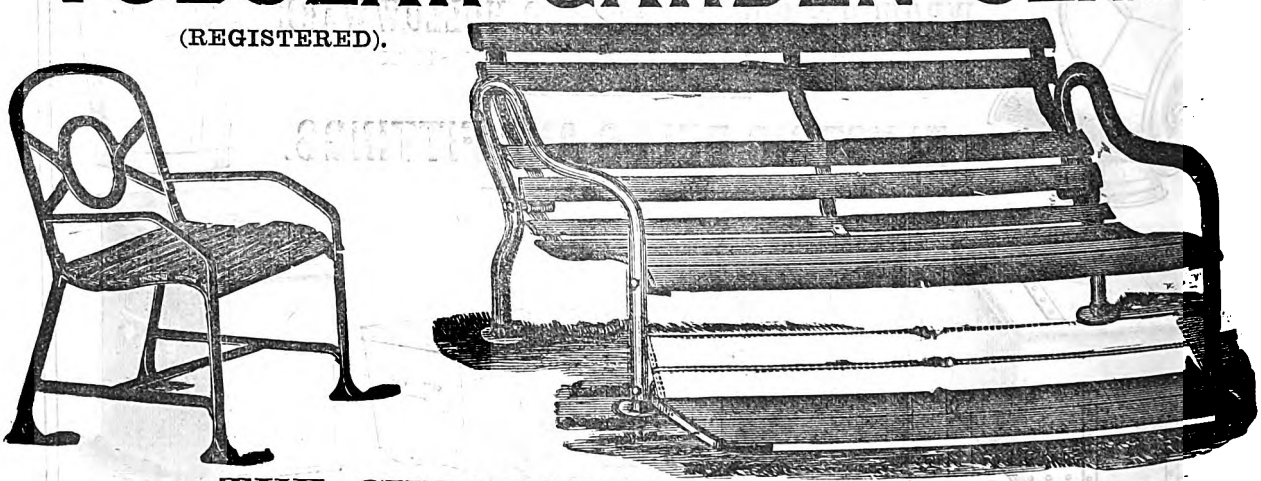
AISO

TUBULAR GARDEN SEATS

(REGISTERED).



THE CHEAPEST IN THE MARKET.

LIGHTNESS, STRENGTH, DURABILITY, ELEGANCE, AND COMFORT ALL COMBINED.

The Single Seat is made of Oval Tube, and has a Spring Back.

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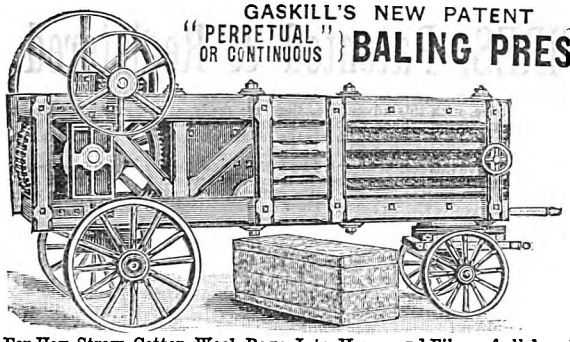

For Hay, Straw, Cotton, Wool, Rags, Jute, Hemp, and Fibres of all descriptions, to work by hand, horse, or steam power. Out-turn, 12 to 24 bales per hour.
Prices from £35 upwards. Catalogue post free.
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109 Vincent St., GLASGOW, Scotland,
Manufacturers of
CORRUGATED IRON Tube-Jointed, Arc-Sheets, &c.
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Patent Solid Joint Steel TANKS and CISTERNS,
Air and Water Tight, light but exceedingly strong. The plates for these tanks are specially prepared and strengthened, and the corners are triply protected.
ANTI-THERMAL PANELS FOR ROOFS AND WALLS.
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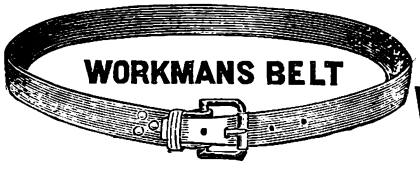
The best and most economical for all kinds of Buildings in any climate Portable and strong, they effect a great saving in framing, whether of Iron or Wood. Rain, Fire, Sound, Heat, and Cold Proof.



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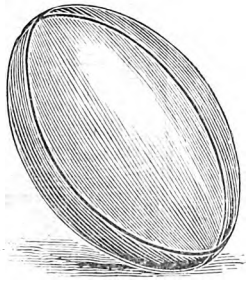

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GALVANIZERS OF EVERY DESCRIPTION OF GOODS.

Manufacturers of every variety of Sheet Iron Goods, and for all Markets.

QUALITY, ECONOMY, & DISPATCH.

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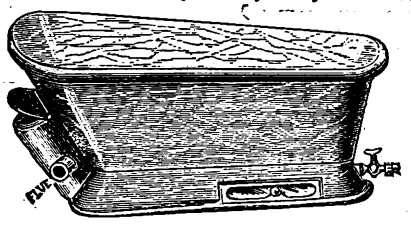
HILL'S "ACME" PRIZE MEDAL GAS BATH.

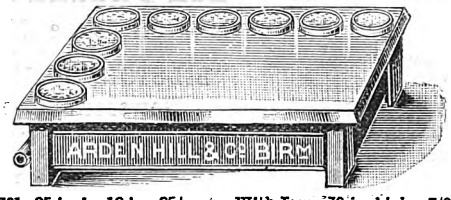
Awarded FIRST PRIZE by the Royal Polytechnic Society.



A Warm Bath ready in 15 minutes at a cost of One Halfpenny. Easily fitted in any house. Price from £4 4s. complete, including fittings. Compare the cost of this with the ordinary method of fitting up bath-rooms. No house should be without one.

HILL'S "ACME" GAS HOT PLATE (Regd.).

For Pancakes, Pikelets, Muffins, Scones, Oatcakes, &c.



No. A701. 25 in. by 18 in.,	25/	With Legs, 30 in. high,	7/6 extra.
No. A702. 36 in. by 25 in.,	50/	" "	10/ "
No. A703. 45 in. by 28 in.,	80/	" "	15/ "
No. A704. 48 in. by 25 in.,	90/	" "	15/ "

"ACME" PORTABLE BOILERS FOR COAL OR GAS.

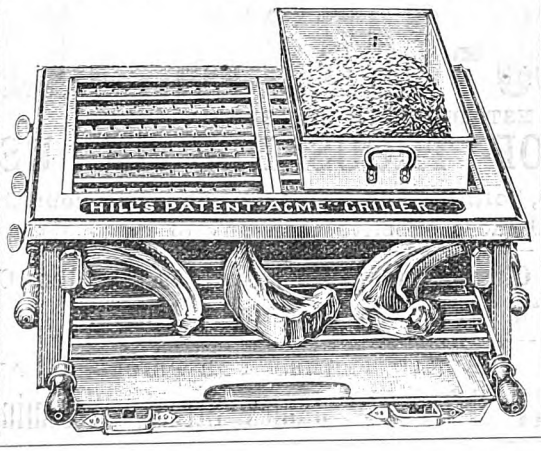
If desired the Boilers can be supplied enamelled white inside. Prices on application.

No. A92.—Fitted for Coal or Gas.

6-gallon	...	...	...	...	...	20/
8 "	...	...	...	...	...	25/
10 "	...	...	...	...	...	27/6
12 "	...	...	...	...	...	30/
14 "	...	...	...	...	...	35/
16 "	...	...	...	...	...	40/
20 "	...	...	...	...	...	50/
25 "	...	...	...	...	...	65/
30 "	...	...	...	...	...	80/

Larger sizes to order.

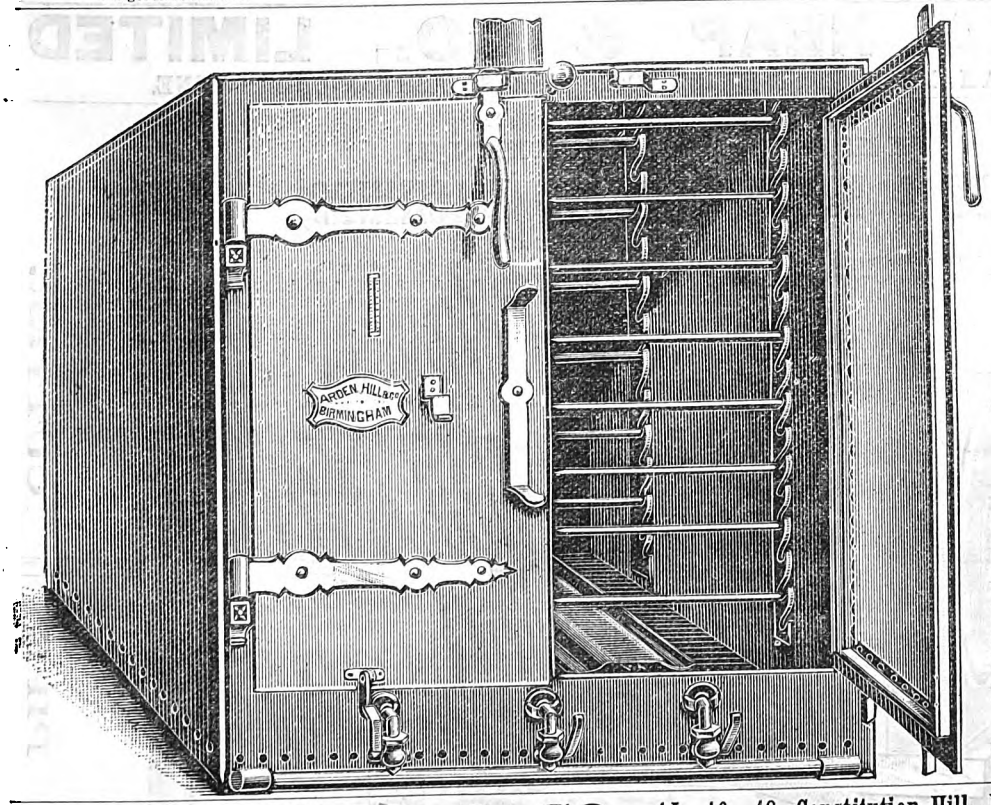
HILL'S PATENT "ACME" GRILLER.



HILL'S "ACME" INSTANTANEOUS WATER HEATER.

Instantly provides Hot Water for Baths and other purposes. The fumes of the gas-burner do not come into contact with the water. Made entirely of copper. Very durable, and readily taken to pieces for cleaning. The burners draw out for lighting. Is the most simple, efficient, and best Water Heater in the market.

No. A95.	Half a gallon of Hot Water per minute ...	£3	3	0
No. A96.	One gallon of Hot Water per minute ...	4	10	0
No. A97.	Two gallons of Hot Water per minute ...	6	10	0



GAS JAPANNING OVEN.

Suitable for

Bicycles,

Coffin Furniture,

Enamelling,

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&c., & c.

Cheaper and quicker than coal ovens. Temperature of oven, 250° in 10 minutes from lighting. Cost of gas per hour 1*d.* to 1½*d.*, according to size.

Prices from £5.

ARDEN HILL & CO., 14, 16, 18 Constitution Hill, BIRMINGHAM.

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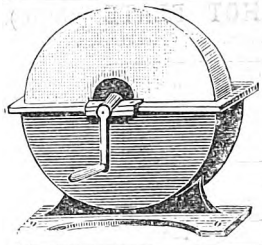

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Grindstone Maker, WOLVERHAMPTON.

"BILSTON" GRINDSTONES, with or without frames.
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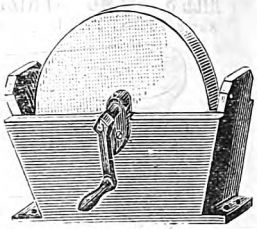
THE CHEAPEST and BEST FINISHED STONES in the MARKET.
SEND FOR NEW LISTS.



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COLD ROLLED AND CLOSE ANNEALED
TRUNK SHEETS and FENDER SHEETS.
Also Iron and Steel Sheets for Galvanizing, Stamping, and Making-up Purposes.

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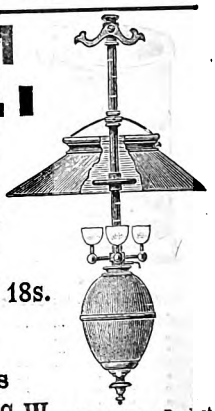
THE ALBO-CARBON LIGHT.



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HUNDREDS OF THOUSANDS IN USE.
Unequalled for Brightness, Softness, and Economy. Save half your Gas Bill.
Cheaper and more effective than any of its rivals.

Single Lights from 6s., Clusters from 40s. to 145s. Albo-Carbon 18s. per cwt., 3d. per lb. Genuine Fluted.

AGENCIES GRANTED. LIBERAL TERMS. FOR PRICES, &c., ADDRESS
ALBO-CARBON LIGHT CO., 74D James Street, Westminster, S.W.
4-light Shop Pendant 52/- complete.

JOSHUA HEAP & CO., LIMITED,

OLDHAM ROAD ENGINEERS' TOOL WORKS, ASHTON-UNDER-LYNE.

PATENTEES AND MANUFACTURERS OF
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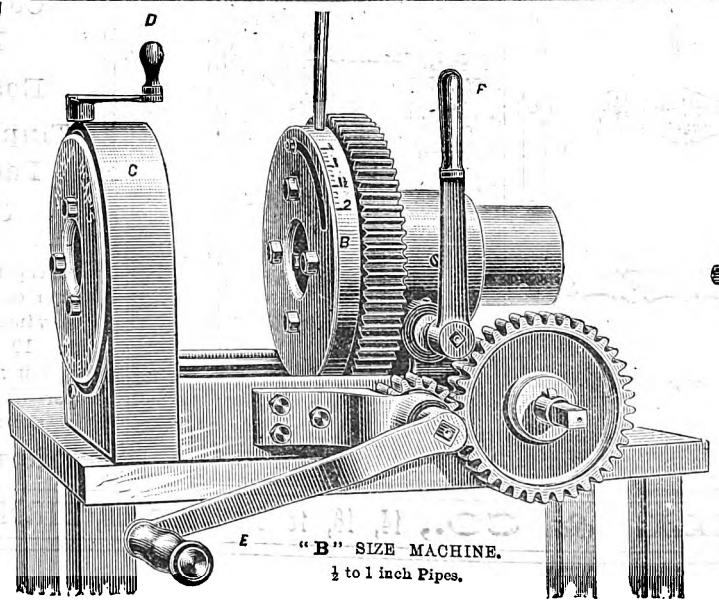
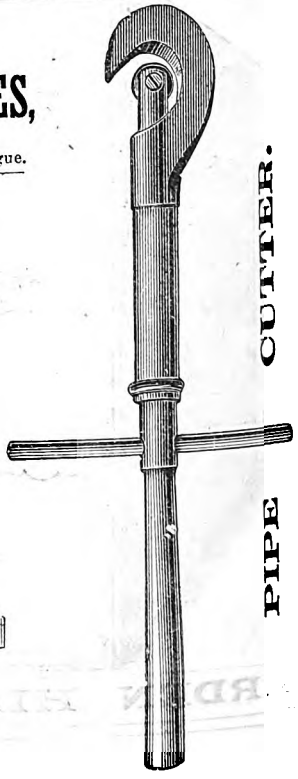
PIPE & BOLT SCREWING MACHINES,
To screw from ¼ in. to 6 in. diameter.
Important improvements have recently been made. Send for New Illustrated Catalogue.



"B" SIZE MACHINE.
½ to 1 inch Pipes.



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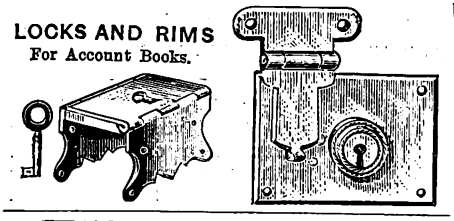
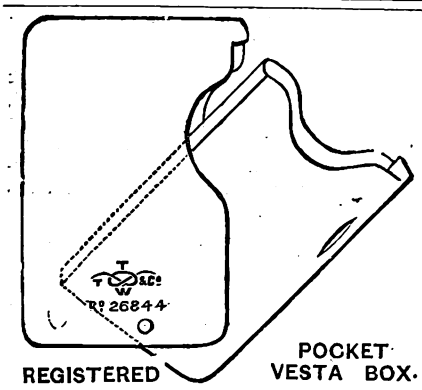
ESTABLISHED 1800. (James Stone Dumbell, Principal.) ESTABLISHED 1800.

Phœnix Lock and Metal Works & Premier Safe Works, WOLVERHAMPTON.

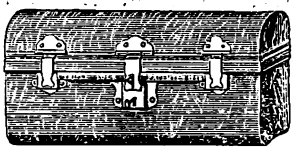
LOCKS AND RIMS
For Account Books.





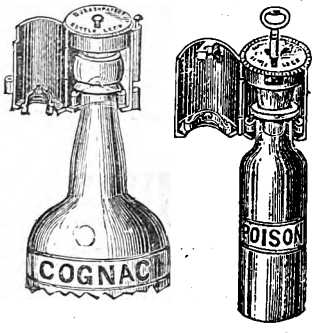
REGISTERED POCKET VESTA BOX.

TURNER'S PATENT TRIPLE TRUNK LOCK.



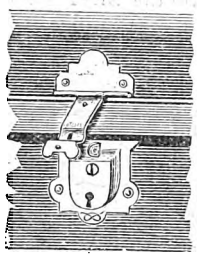
The above representation shows a Direct Action Treble Locking Trunk Lock. All outside fittings easily fixed.

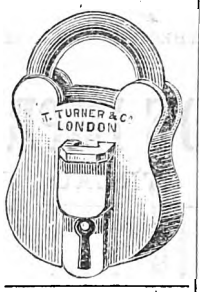
Burn's Patent Bottle Lock

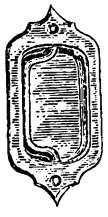


For Snapping over Neck and Locking, to prevent interference with the contents of the bottles.

Gloster Registered Locks for Trunks.

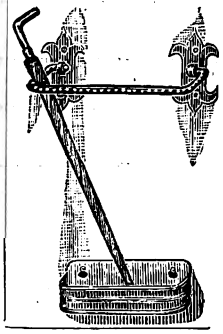


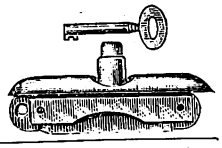




Patent Novelty Cruet and Egg Stands.

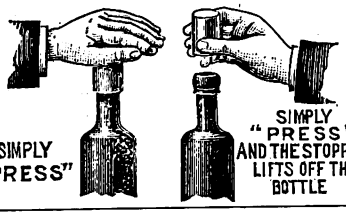
The "Compact" Umbrella Stand for Churches.





NICKEL-PLATED WAITERS.

Jackson's Patent Bottle Stoppers.



GAS AND WINDOW FITTINGS AND BRASS-WORK OF ALL KINDS POLISHED AND LACQUERED, AND DONE UP AS NEW.

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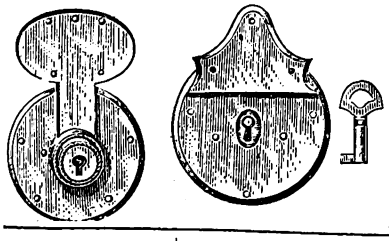
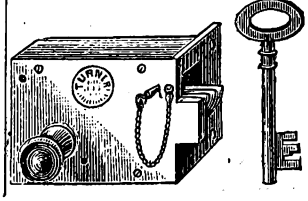
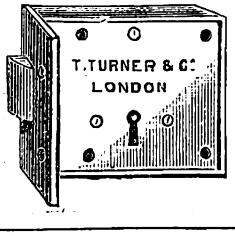
Electro, Nickel, Brass, and Copper Plating for the Trade.

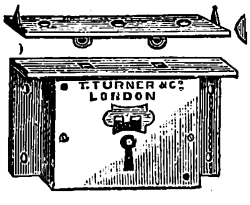
FOLIO AND LETTER BAG LOCKS.



TURNER'S LEVER COMBINATION NIGHT LATCH.







Manufacturers of
GENERAL CABINET LOCKS OF ALL KINDS.
BRASSFOUNDRY AND FANCY METAL GOODS OF EVERY DESCRIPTION.
PLAIN AND FANCY WAITERS.
CARD AND BISCUIT TRAYS, AND NUMEROUS OTHER ARTICLES FOR PATENTEES AND PROPRIETORS OF REGISTERED GOODS.

DEED BOXES AND STANDS.

FIRE AND BURGLAR PROOF SAFES.

Of high-class workmanship. Best Material only used.

PRICES AND DISCOUNTS ON APPLICATION.

Special Estimates for Safes to Specification.

TIN-PLATE WORKERS' FURNITURE.

LEVER OVERLAND & SCARBORO' TRUNK LOCKS.

Locks, Latches, and Keys for Home and Foreign Markets.

Orders through all respectable Merchants and Factors.

TRADE MARK
PREMIER
SAFE

THOMAS TURNER & CO., having extensive premises and plant, are open to manufacture specialities connected with the Hardware or Metal Trades; new companies, patentees, &c. wishing to avoid the expense of manufacturing, will find this an opportunity seldom to be met with.

LONDON DEPOT—104 CITY ROAD, E.C.

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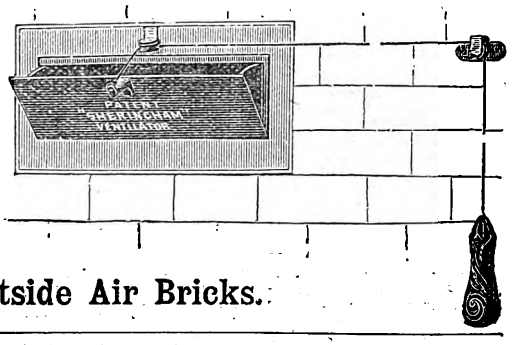
VENTILATION.

The simple forms of Ventilation rest on the principle of an OUTLET for the warmed air, and an INLET for the fresh air.

HAYWARD'S SHERINGHAM INLET VENTILATOR



For the introduction of **FRESH AIR** through an External Wall without a Draught.

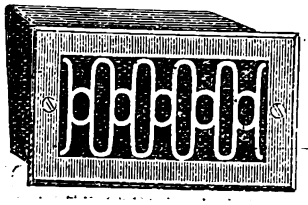
9×3, 9×6, 13½×6, 15×10 in., size of box.

In Plain Iron, Galvanised, Japanned Bronze, &c.

Pulley can be on the right or left hand.

To be "Complete" requires—Outside Air Bricks.

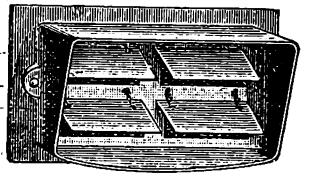
IMPROVED MICA OUTLET VENTILATORS



No. 1, Front, 11×7 in.

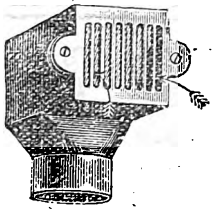
For the Discharge of Heated and Vitiated Air from Rooms into the Smoke Flue.

11×5, 11×7, 11×9, 11×11, 16×11, size of front; also 5×11 and 7×11 in.



Back, 11×7 in.

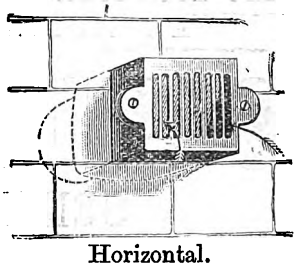
FRESH AIR MICA INLET VALVES.



Vertical.

For Ventilating Drains, in Galvanised Iron.

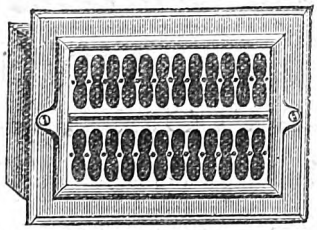
For 3-in. or 4-in. Pipes, Vertical or Horizontal.



Horizontal.

HAYWARD'S SILK-FLAP OUTLET VENTILATORS.

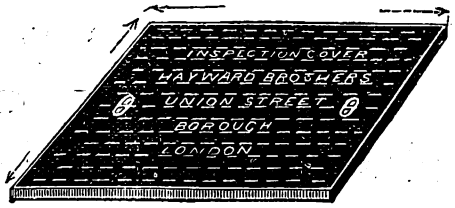
For Prevention of Down draught in Air-extracting Shafts.



9×3, 9×6, 9×9, 13½×9 in., size of box.

AIR-TIGHT INSPECTION COVERS TO DRAINS.

To suit Stone Curbs or Asphalte and Concrete Floors.



Stock Sizes—27×27, 27×21, 21×21, 15×15 in., outside.

PRICE LISTS AND FURTHER PARTICULARS ON APPLICATION.

13 MEDALS AWARDED.

HAYWARD BROTHERS & ECKSTEIN,

MANUFACTURERS OF ALL KINDS OF VENTILATORS,

Works—187, 189, 191, & 193 UNION STREET, BOROUGH, LONDON, S.E.

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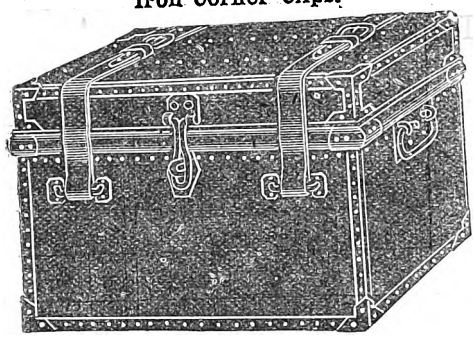
COMMERCIAL TRAVELLERS'

SAMPLE CASES

Strong Hoop Iron Riveted Seams and Malleable Iron Corner Clips.



This is a strong and compact piece of workmanship, all machine-made. Seams will not break. Any size made to order at short notice.

TRAVELLING TRUNKS, BIRDCAGES, &c.

CHARLES MOHR,

113 Bradford St., BIRMINGHAM.

ESTABLISHED 1862.

THE "STOTT"

Patent Insecticide

MANURE DISTRIBUTOR,

Cheap, Simple, and Effectual.

THE "STOTT"

PATENT SPRAYER

GIVING A MIST-LIKE SPRAY; CANNOT CHOKE.

Certain death to Insect Pests on Vines, Hops, Fruit Trees, Roses, &c.

PRICES ON APPLICATION.

THE "STOTT" FERTILISER-INSECTICIDE DISTRIBUTOR CO., LIMITED,

BARTON HOUSE, MANCHESTER.

SAMUEL HEATH & SONS, LIM.

GENERAL STAMPERS AND PIERCERS,

Manufacturers of every description of

STAMPED BRASS FOUNDRY

BEDSTEAD & FENDER FITTINGS,

FANCY CANDLESTICKS,

FINGER PLATES, DOOR FURNITURE,

COAL-VASE FITTINGS, CORNICE-POLE ENDS.

Quotations given on application for any Specialities.

COBDEN WORKS,

LEOPOLD STREET, BIRMINGHAM.

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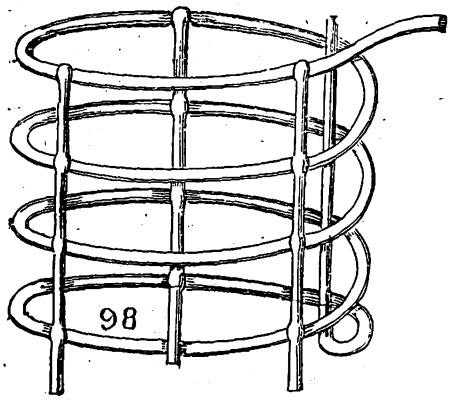
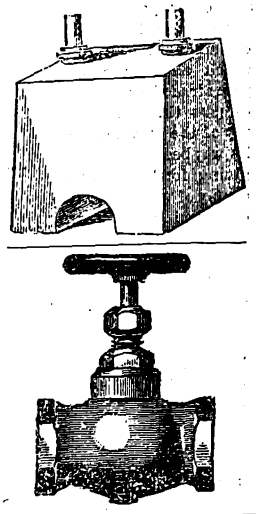
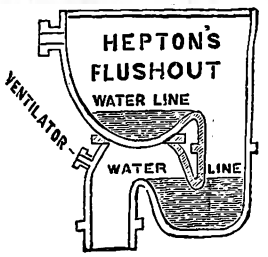
COPPER CYLINDERS
CHEAPER THAN GALVANIZED IRON
HEPTON & SON, BRASS & COPPER WORKS, LEEDS.







All White,
in 2 Pieces,
8s. 6d.

HEPTON & SON, HUNSLET LANE & SOUTH BROOK ST., LEEDS.

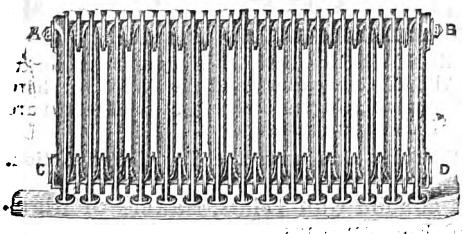
KEITH'S PATENT "UNIVERSAL" COILS
FOR HOT WATER HEATING.

Cast in One Piece. No Joints to leak. No Metal Screens required.

"UNIVERSAL" COILS OR RADIATORS
IN VARIOUS COMBINATIONS.

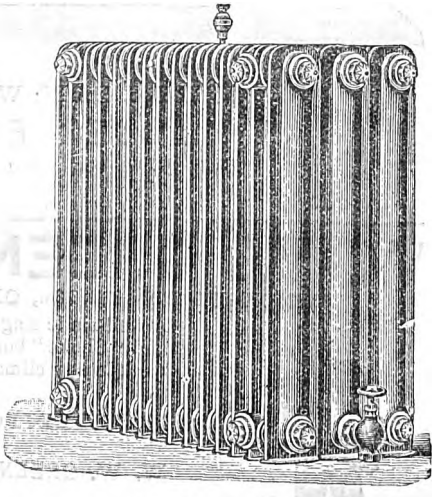
Cheapness, Neatness, and Efficiency combined.

A NEW DEPARTURE IN HOT-WATER HEATING.



These Coils are most compact and very powerful, and can be lengthened or grouped together as desired.

PRICES AND DETAILS ON APPLICATION.



JAMES KEITH, C.E., 57 Holborn Viaduct, LONDON, E.C.

33 Frederick Street, EDINBURGH; and Works, ARBROATH.

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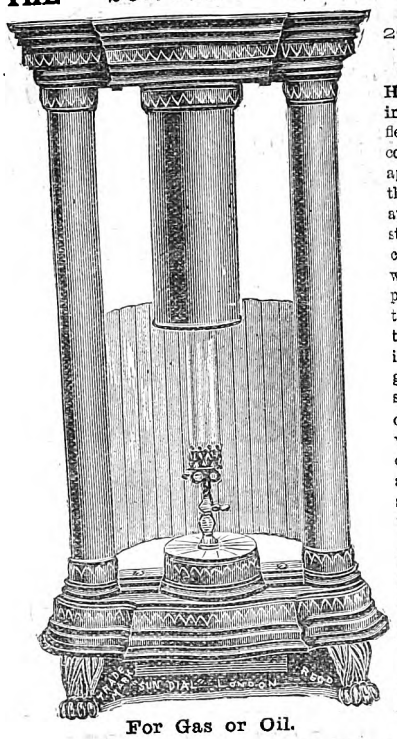
THE "SUN-DIAL" CONDENSING STOVE

REQUIRING NO FLUE.

20 AWARDS.



The "Sun-Dial" Heating Condensing Stove not only reflects the heat from the copper reflector into the apartment, and radiates the heat from the columns and other parts of the stove, but has in each side column an INNER tube, which allows the cold pure air of the apartment to pass through to the top of the stove, and on its way becoming heated, giving forth a constant supply of warm air, without coming in contact with the products of combustion, thus giving about 25 % extra heating surface without any extra cost.

The products of combustion, being all condensed within the stove, are passed off in a liquid state into a movable tray beneath.

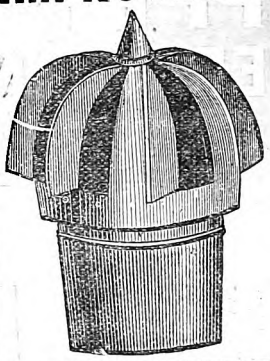
Price Lists of Stoves, Sun-Burners, &c., on application to

For Gas or Oil.

BILLING & CO., Smart's Buildings, LONDON, W.C.

(Smart's Buildings is next to 185 High Holborn, near New Oxford Street.)

IMPROVED SMOKE COWLS



For Curing Smoky Chimneys of a Weak Draught or Blow-down.

STRONG & DURABLE.

Lists and Prices on application.

J. COCHRANE,
KIRKGATE, LEITH.
Manufacturer also of
ARCHIMEDEAN VENTILATORS, SYPHON CISTERNS, AND GREENHOUSE FUMIGATORS.

REDUCTION IN THE PRICE OF COAL
Is effected by using

THE UTILITY CINDER SIFTER.

It utilises in a

QUICK, CLEAN, and EFFECTIVE

manner that which is at present thrown away as useless, and a saving of at least 25 per cent. in your Coal Bills will result. It is the Cheapest and Best Sifter made. Weight under 6 lbs.

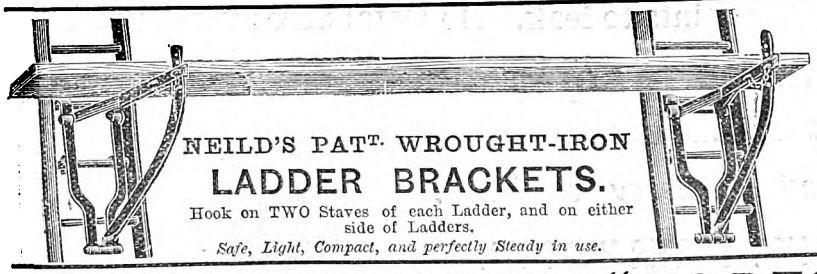
PRICES ON APPLICATION TO THE PATENTEES—

D. CLARK & SON,
Wholesale Brush Manufacturers,
249 STAFFORD STREET, WALSALL.
Illustrated Brush Catalogue on application.

WHITFIELD'S TABLES OF PROFITS AND EXPENSES
Or PRICING TABLES.

The cost of any article and the percentage of working expenses being known, these tables enable manufacturers to determine at once, without risk of error, at what price it must be sold, in order to realise ANY RATE of profit up to 50 per cent. Approved of and in use by some of the leading firms of Manufacturers. Size—8½ in. by 13 in.; strongly bound, in stiff cloth covers, for Office use. Price, 10/6 post free, from the publisher,

S. I. WHITFIELD, SPARKBROOK, BIRMINGHAM.



NEILD'S PATT. WROUGHT-IRON
LADDER BRACKETS.
Hook on TWO Staves of each Ladder, and on either side of Ladders.
Safe, Light, Compact, and perfectly Steady in use.

Instantly forming a Platform at any height, for such purposes as
Painting, Sign Writing, Pointing, Fixing Gutters, &c.
25s. per Pair.
Supplied subject to return if not approved.

JACOB NEILD,
LIVERPOOL ROAD,
MANCHESTER.

W. W. GREENER'S "FORESTER" GUN.

PRICE—PLAIN £13 13s., OR FANCIFULLY FINISHED AND ENGRAVED, £14 14s.

A well-made English Gun, with Greener's WORLD-RENOWNED TREBLE Wedge, Fast action and "Choke" boring. The STRONGEST and CHEAPEST Gun extant, and the BEST for hard work in any climate. High-class workmanship, best material, elegant design, and solid worth are embodied in this Gun, which never fails to give satisfaction.

DOMINION GUN.—A first-class Shooting Gun with the Top Lever Action. Price 9 Guineas.

W. W. GREENER, Winner at all the Great London Gun Trials, Makers of High-class Hammerless and Ejector Guns.

THE LARGEST STOCK OF FINE GUNS IN GREAT BRITAIN AT ALL PRICES.

Full particulars and prices on application.

A LIBERAL DISCOUNT TO THE TRADE

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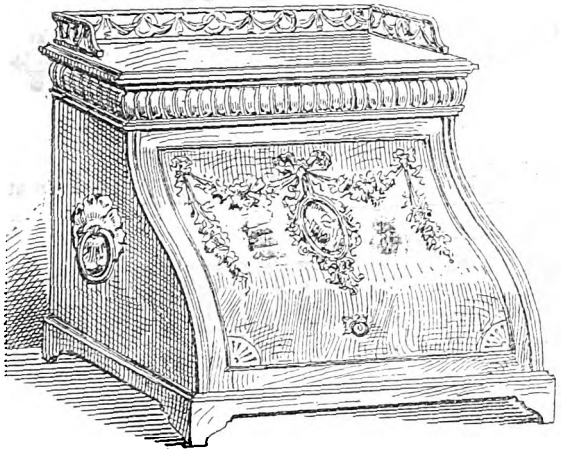
SHAPLAND & PETTER,



No. 1902.—The "RALEIGH."

RALEIGH CABINET WORKS,

BARNSTAPLE,

Wholesale Manufacturers of soundly-made and Artistic

WOOD COAL BOXES

From 9/6 to £10 each.

PERFECTION OF DESIGN AND WORKMANSHIP.

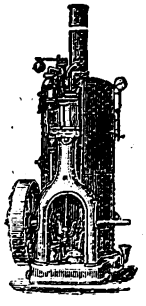
TEA TRAYS

In a splendid assortment of Fancy Woods, inlaid and plain, from 6/ to 90/.

ALEXR SHANKS & SON,

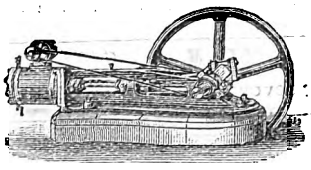
Dens Iron Works, ARBROATH; and 110 Cannon St., LONDON.

TELEGRAMS—"SHANKSON LONDON."



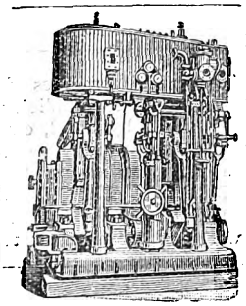
Vertical Engine and Boiler.

CRANES:
Steam, Hand, Portable, Fixed.



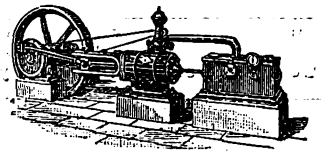
"Caledonian" Horizontal Engine.

SEMI-PORTABLE ENGINES.

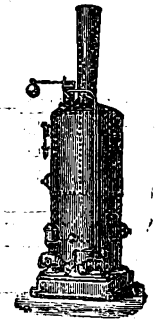


Compound Condensing Marine Engine.

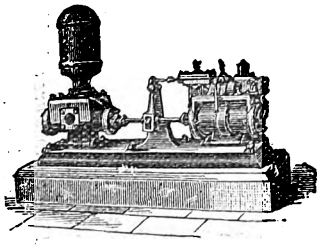
BOILERS:
Marine, Cornish, Lancashire, Loco. Type, and Vertical.



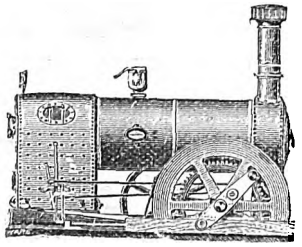
Tandem Compound Condensing Engine.



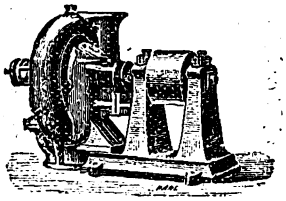
Direct-Acting Pump with Boiler.



Direct-Acting Pump.



Geared Winding and Pumping Engine.



Improved Centrifugal Pump.

Illustrated Price Lists on application. Ask for List O.

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MELBOURNE INTERNATIONAL EXHIBITION, 1880-81,
The ONLY GOLD MEDAL, in addition to FIRST-CLASS HONOURS;
ADELAIDE INTERNATIONAL EXHIBITION, 1887,
The FIRST ORDER OF MERIT, were awarded to

JAMES CARTLAND & SON,

TRADE MARK Cabinet, Builders', Furnishing, & Naval Brass Founders, TRADE MARK

BIRMINGHAM.

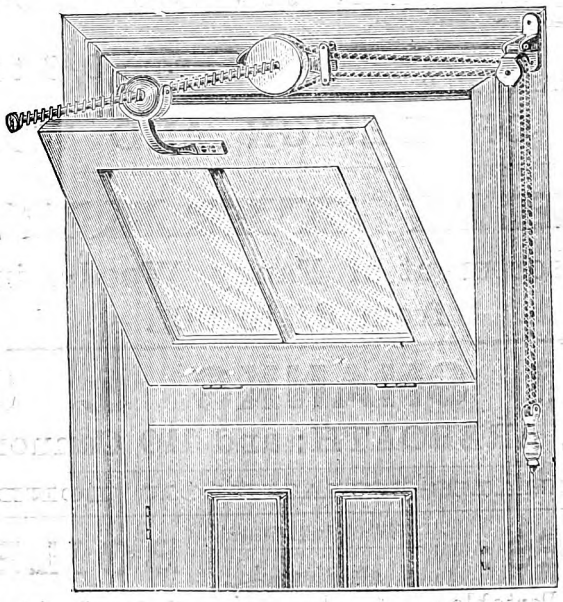
LONDON SHOW ROOMS: 57 HOLBORN VIADUCT, E.C.

N.B.—Complete suites of all kinds of Furnishing Brassfoundry, and Working Models of all Specialties, may be seen at our New Show Rooms, 57 HOLBORN VIADUCT. Buyers are respectfully invited to inspect same.

SPECIALITIES.

PRESTON'S PATENT SCREW ADJUSTMENT

For Opening, Closing, and Securely Fastening Windows.



A749, ½-in. SCREW.

Brass Screw and Brass Fittings, ½-in. screw by 18 in. ..... 11/6 each
Ditto, ditto, ½-in. screw by 20 in. ..... 12/- „
Iron Screw, Brass Wheel, Malleable Fittings, ½-in. screw by 18 in. ..... 10/- „
Ditto, ditto, ½-in. screw by 20 in. ..... 10/6 „

LIGHTER—A866, ⅜-in. SCREW.

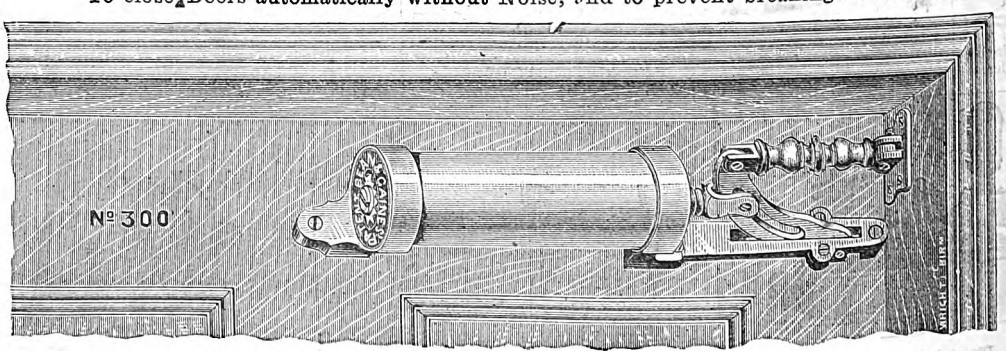
Brass Screw and Brass Fittings—⅜-in. screw by 12 in. ..... 8/- each.
Ditto, ditto, ⅜-in. screw by 15 in. ..... 8/6 „
Iron Screw, Brass Wheel, Malleable Fittings, ⅜-in. screw by 12 in. ..... 7/6 „
Ditto, ditto, ⅜-in. screw by 15 in. ..... 8/- „

NOTICE.—This thoroughly efficient Screw Adjustment provides for opening, closing, and securely fastening Fanlights, Casements, Skylights, &c., and will by its extreme simplicity commend itself to Architects, Builders, &c. An endless cord, passing over a grooved pulley and worked by hand, causes the box to travel on screw, carrying the Sash along with it to the required distance, and remaining securely locked at any angle. The action is perfectly easy, and a child can adjust it.

THE "LEEDS" ATMOSPHERIC DOOR CHECK AND SPRING (BEAN & GAINE'S PATENT).

To close Doors automatically without Noise, and to prevent breaking of Glass.

These Springs are suitable for either right or left hand doors.



These Springs are suitable for either right or left hand doors.

The above Engraving represents a door closed with a "Leeds" Spring, No. 300, with arms fixed on side of door frame, for a door opening from you.
All Goods for Export are carefully packed in Cartoon Boxes, and distinctly labelled with orange-coloured labels, bearing our Trade Mark, as above.

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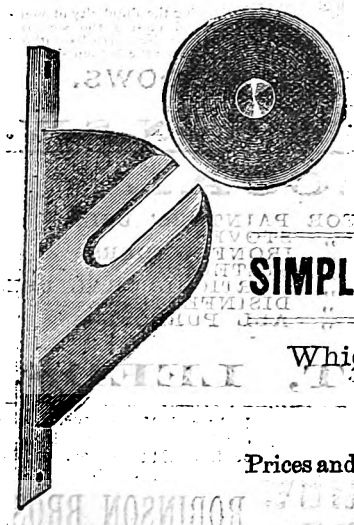
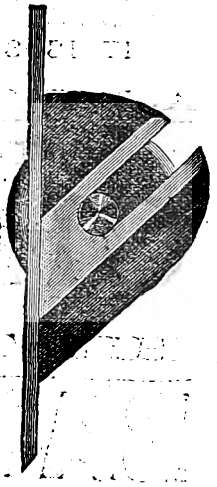
JUST OUT.

THE 'ECLIPSE' AXLE PULLEY



PATENT No. 15074.



ITS LEADING CHARACTERISTICS

ARE

SIMPLICITY, CHEAPNESS & GOOD QUALITY,

Which cannot fail to secure the good opinion of the Trade generally.

Prices and Samples to Merchants, Factors, and Wholesale Ironmongers

FROM THE SOLE MAKERS,

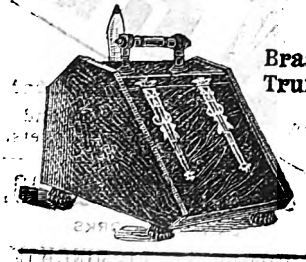
HAWKINS & CO., CROWN FOUNDRY, DUDLEY PORT, TIPTON.

COAL VASES!! COAL VASES!! COAL VASES!!

ABRAHAM UTTLEY & SONS,

ALBION & HOLLINS TIN AND JAPAN WORKS,

HEBDEN BRIDGE, near MANCHESTER.



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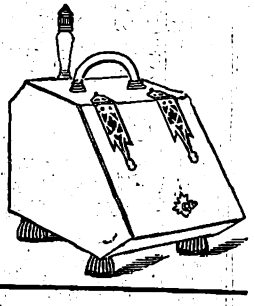
Brass, Wood, and Japanned Coal Vases, Steel Travelling Trunks, Baths, Bonnet and Deed Boxes, Flour and Corn Bins, Toilets, Cash Boxes, and General Tin and Japanned Goods for Home and Export.



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Telegraphic Address:—"Albion, Hebden Bridge."

The "VICTORY"

(PATENT)

BEER ENGINE

No Water-Cistern or Air-Receivers required.

ACTION AUTOMATIC.

From its great simplicity and tear, and consequently the durability of the machine is unsurpassed. Always ready for use, and keeps the beer bright and sparkling. The "VICTORY" can be fitted in shop window, or on counter, as an ornament, or may be stowed under the counter or in any out-of-the-way place. Old style of pumps entirely superseded.

Prices on application from Sole Makers and Licencees—

WYLIE, BROWN & CO.

CLYDE VIEW BRASS and COPPER WORKS,

38 WEST ST. & 2 GREENOCK PLACE, GLASGOW.

Sight-Feed Lubricators with Single and Double Connections a Specialty.

By Her Majesty's Royal Letters Patent. ESTABLISHED

AUSTIN'S New Imperial Patent

SUPERFINE FLAX SASH LINE

The above article is now being manufactured and sold in large quantities for Greenhouse Sashes, Public-house Shutters, and other heavy work. The Manufacturers would recommend it for its strength, and the large amount of wear in it consequent on its peculiar manufacture.

AUSTIN'S IMPERIAL PATENT FLAX SASH AND BLIND LINES (two Prize Medals awarded). The manufacturers of the above articles particularly wish to draw the attention of the trade to their Imperial Patent Flax Sash Lines, of which they are now making six qualities, all of which they can strongly recommend, as they have given unqualified satisfaction to the trade for now over 100 years, and the Proprietors continue to give their personal attention to the manufacture of these goods.

AUSTIN'S IMPERIAL PATENT LOG and HALYARD LINES are now sold in large quantities and are to a great extent superseding the old sorts.

They also invite the particular attention of the trade to their IMPERIAL PATENT BLIND LINES, which are very superior to anything yet offered.

They can be obtained of all Ropemakers, Ironmongers, Merchants, Factors, and Wholesale Houses, in town or country.

N.B.—Please note that all our Goods, as advertised above, are labelled either inside or outside with our Trade Mark, the "Anchor."

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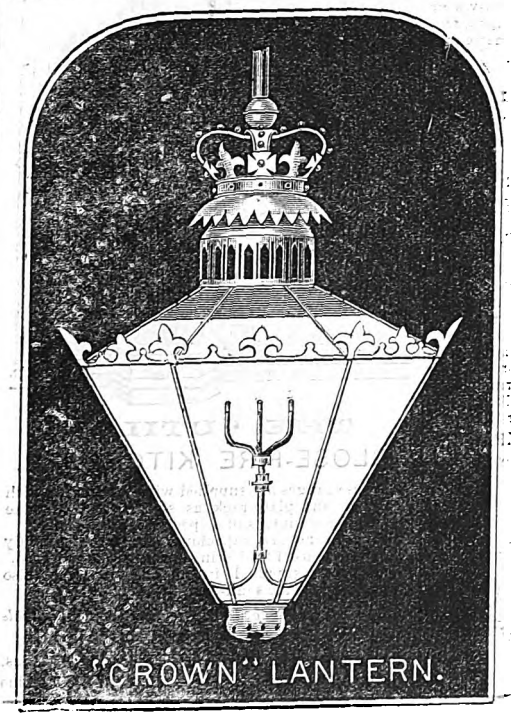
BRAY'S GAS APPARATUS.



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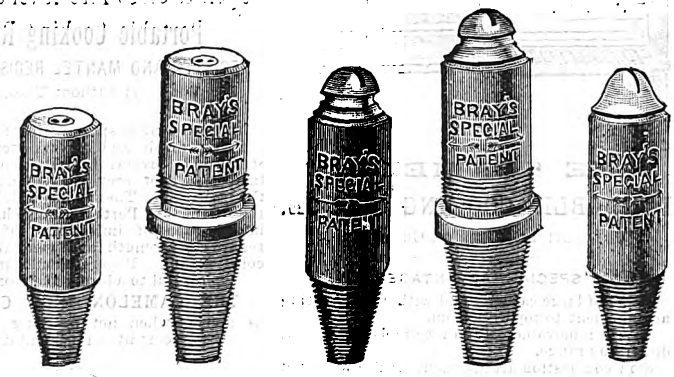
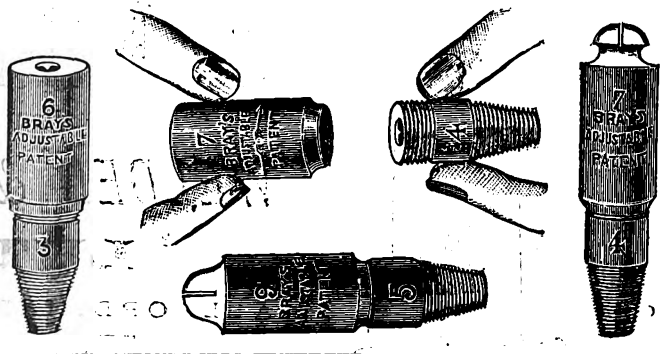
Best for General Use.

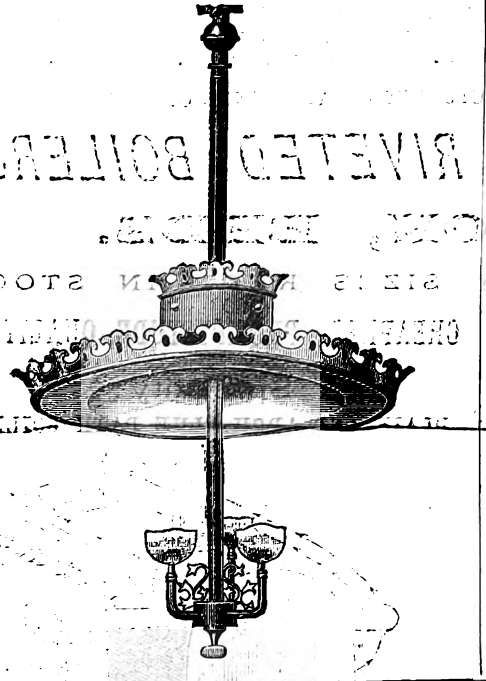


SAVE COST IN 60 HOURS' USE.

"ADJUSTABLE" BURNERS

For very high Pressures.





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NEW PATTERN

WOOD COAL BOXES.

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HORSE CLIPPERS

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For all SEASON'S GOODS write for PRICE LIST.

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GAS HEATING STOVES, GAS COOKERS, GAS GRILLERS, SLOW COMBUSTION and other **HEATING STOVES.**

KITCHEN RANGES, KITCHEN MANTELS, KITCHEN ASHGUARDS, REGISTER STOVES, Fine Cast or Berlin Blacked, with Victoria Bronzed Interior, Tiles, &c.

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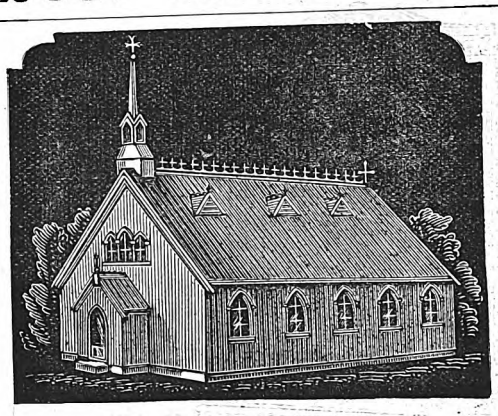
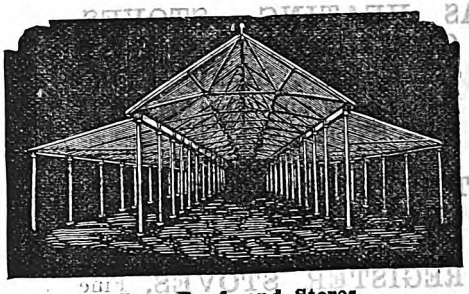


Iron Churches and Schools.



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Estimates given for Galvanised Iron Piggeries, Poultry Pens, Pheasantries; also for all descriptions of Ornamental Palisading and Railing.

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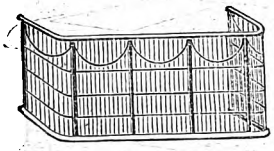

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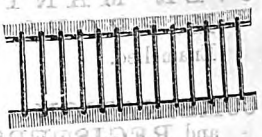

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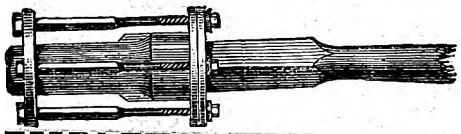

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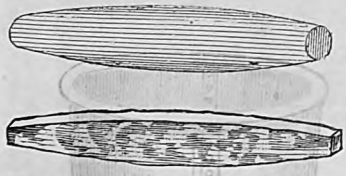
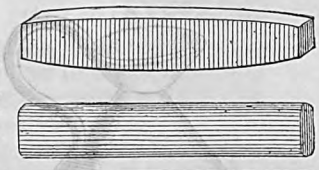


Before placing orders elsewhere ascertain my prices, which will be found specially low if ordered now for delivery next season. Specialities:—Waterloos, Talacres, Welsh, Devon Batts, Derby Batts, red or white Balaklavas, Common Round, Indian Pond, and Ragstones.



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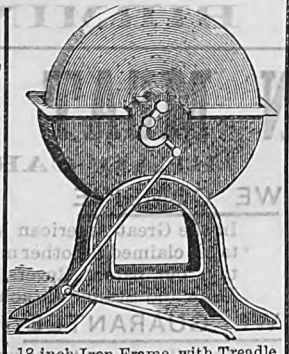
With Treadles and Handles complete, from 7*s.* 6*d.* each.

18-inch Wood Frame, with Treadle complete, 15*s.* 6*d.*



18-inch Iron Frame, with Treadle complete, 19*s.* 6*d.*

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GRINDSTONES
SUITABLE FOR ALL TRADES

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All Sizes, Bound, from 3*s.* 11*d.* per doz.
Lined „ 5*s.* 11*d.* „
Pockets bound and lined on improved method. Other sizes at proportionate low prices. *See full Lists.*

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All Sizes, from 6½*d.* per nest.
Bound, „ 9½*d.* „
Also see our new size Hand Baskets.

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Turkey Oilstones, Turkey Sheep Shear Oilstones, Arkansa, Washita, Nova Scotia, Hindostan, Charnley Forest, Welsh, Canada, Yellow Lake, Water of Ayr Stones (in Carpenters' Hones, in Rough and Dressed Blocks, Octagons, &c.), Grecian, German Hones, Penknife Hones, Blue and Grey Stone Slips, Gold Testing Stones, Clearing Stones, Curriers' Blocks, Turkey, Arkansa, and Putty Powder, Marble Masons' 1st and 2nd Grit, Circular Stones, all kinds; Mounted Oilstones and Hones, various; also all in Slips, Slabs, Pencils, Whetstones, Emery Table Knife Sh[illegible]

I beg to inform the Trade generally that I have just succeeded the old-established Scythe, Shoe, and Grindstone Business of J. SEAL. Customers will oblige by addressing all correspondence to London.

BUY THE GENUINE WELSH SCYTHESTONES, NOW UNIVERSALLY ADMITTED TO BE THE BEST & CHEAPEST.

SPECIAL LINES.

About 500 Mounted Grindstones, as sketch, assorted, in 3 sizes, 8*s.* 9*d.* the set of three.

1,000 dozen Mounted Razor and Penknife Hones, polished handles, at the extra low price of 3*s.* 6*d.* dozen.

A few grosses genuine Turkey Gouge Slips, assorted and warranted, 4*s.* 9*d.* dozen.

50 gross only of New Pond Stones, 16*s.* 6*d.* per gross, fully worth 30*s.* gross. Former lot all sold.

Large quantity of Sheep Shear Slips (warranted), 1*s.* 6*d.* dozen, worth 3*s.* dozen.

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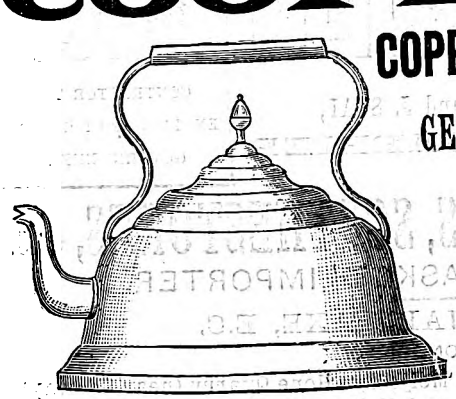
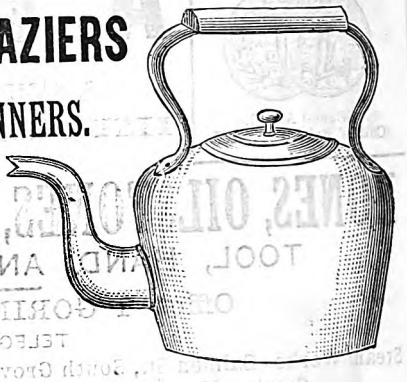
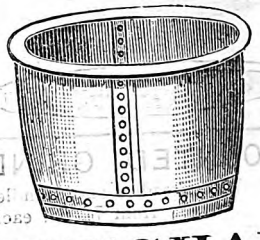




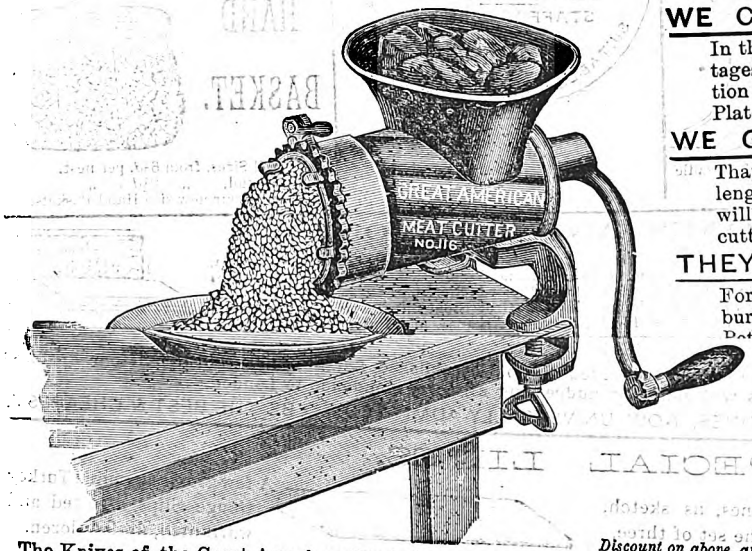
PRICES AND SPECIAL QUOTATIONS ON APPLICATION.



32 WOODCOCK ST., BIRMINGHAM.

THE GREAT AMERICAN MEAT CUTTER.

READ CAREFULLY—



WE COMBINE

In the Great American Meat Cutter all the advantages claimed for other machines, and it has in addition our patent Reversible Knife, Self-Adjusting Plate and Stuffer Attachment.

WE GUARANTEE

That the Great American Meat Cutter in the same length of time and with same amount of power will cut more meat and better than any other cutter on the market.

THEY CANNOT BE EXCELLED

For cutting Sausages, Mince Meat, Clams, Hamburg Steaks, Cheese, Chicken Croquettes, Mashing Potatoes, Grinding Crackers, &c., &c.

112. Small family size, will cut 2 lbs. of meat per minute .. ..list 8/6
118. Popular family size, will cut 3 lbs. of meat per minute .. ..list 12/6
120. Popular family size (without clamp), will cut 3 lbs. of meat per minute .. ..list 10/6
122. Popular butcher size, will cut 4 lbs. of meat per minute .. ..list 18/6
126. Popular butcher size, for pork, 5 lbs. of meat per minute .. ..list 33/6
124. Popular butcher size, with 40 in. fly-wheel, will cut 300 lbs. per hour .. .. ..list 105/

Discount on above, and larger sizes, quoted on application to Wholesale Buyers.

The Knives of the Great American Meat Cutters makes a clean shear cut, and do not tear the meat. No screw to hold the Handle in place is required, and the stuffer attachment fastens to the outside plate and does not interfere with the cutting.

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SEEGRUN'S PATENT. SEEGRUN'S PATENT.

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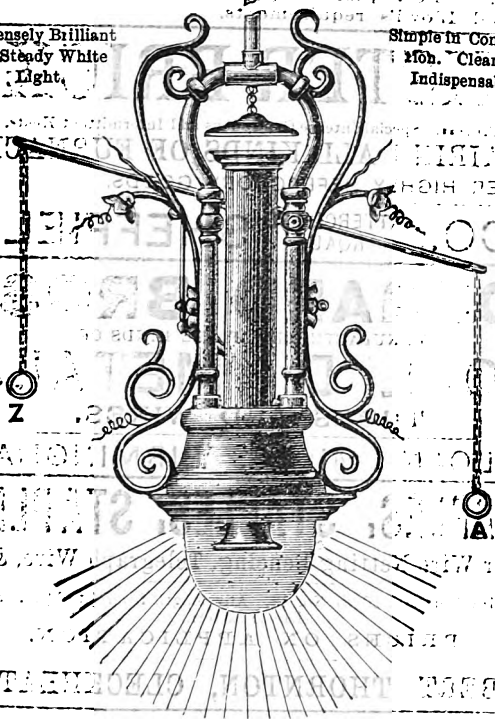
Simple in Construction. Cleaning Indispensable.



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12-Bore Sporting Cartridges, loaded Best T.S. Black Powder, Best Hardened Shot. Price very low.
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Makers of Tanks to Admiralty, Trinity House Corporation, Colonial Governments, &c.

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GROUND GANISTER FOR LINING AND REPAIRING ALL KINDS OF FURNACES,

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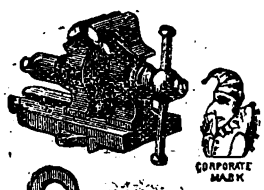

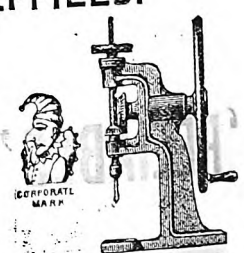

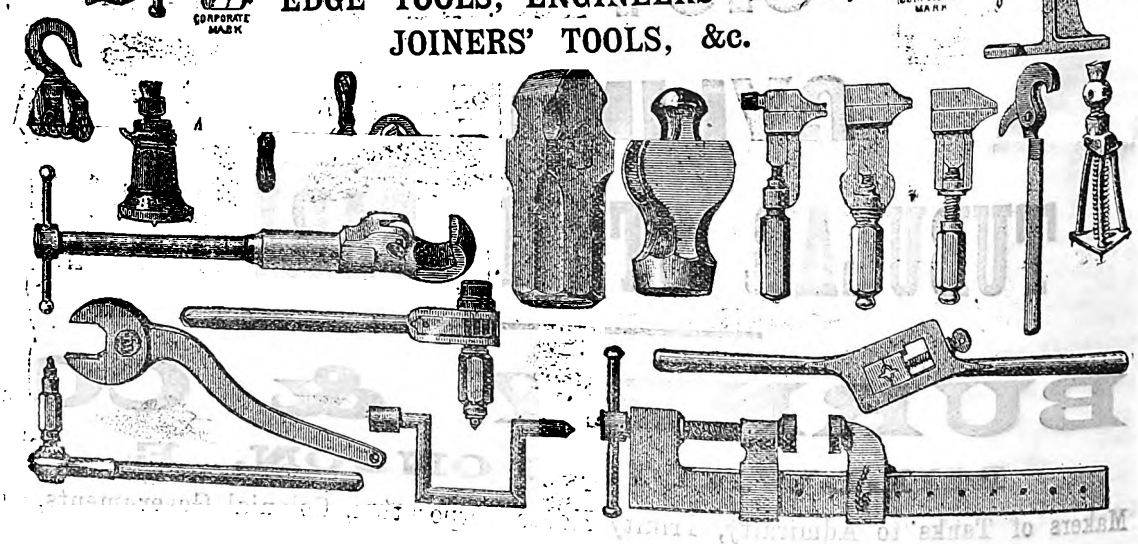

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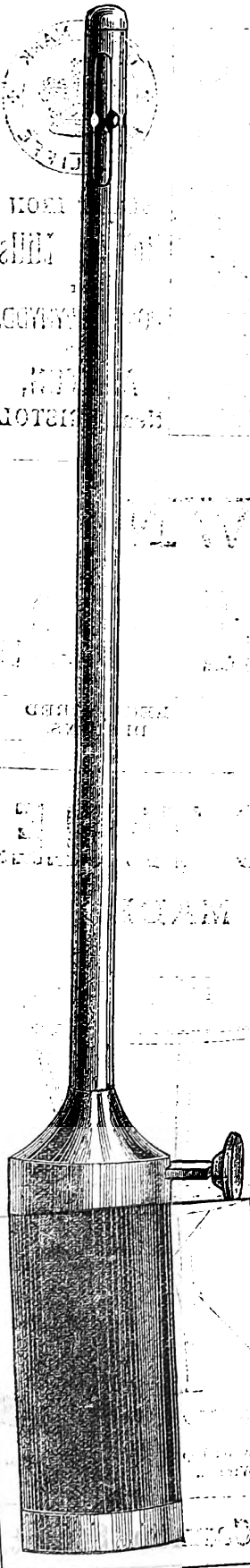

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16 in. over all, **12/6.**

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IRONMONGERS Interested In ELECTRIC LIGHTING or ELECTRIC BELLS should write for our latest Catalogues of Electric-Lighting Supplies and Electric Bells, the most important Catalogues ever published on Electrical Supplies.

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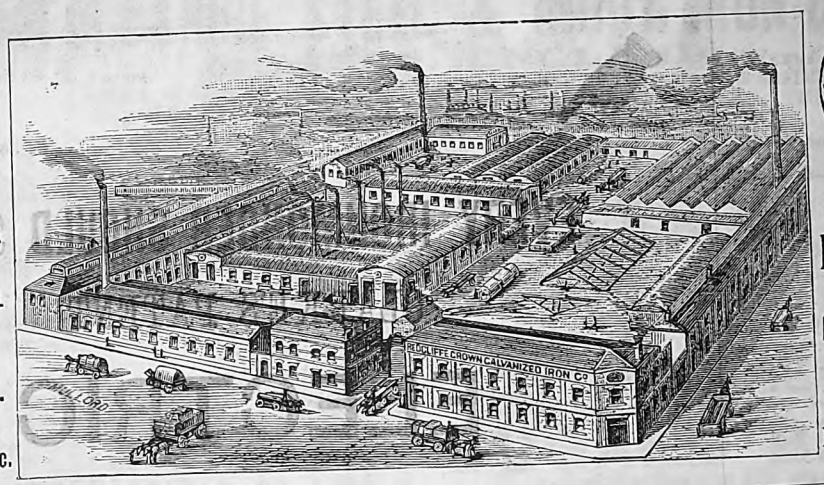
TRADE MARK REDCLIFFE

GALVANIZING AND CONSTRUCTIONAL WORKS, ST. PHILIPS, BRISTOL.

LONDON OFFICES: 118 CANNON STREET, E.C.



TRADE MARK REDCLIFFE

SHEET IRON Rolling Mills AT PONTNEWYNYDD, AND ASHTON, Near BRISTOL

REDCLIFFE CROWN GALVANIZED IRON CO. BRISTOL.

Telegrams— "REDCLIFFE BRISTOL."

REGISTERED DESIGNS.

GARDEN CHAIR, STOOL, AND TABLE.

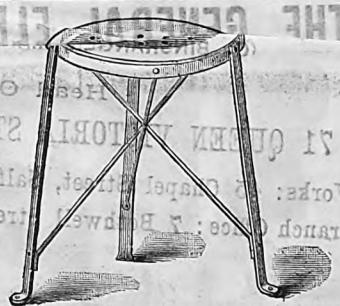
THE CHEAPEST & STRONGEST MADE.

GALVANIZED AFTER MADE.

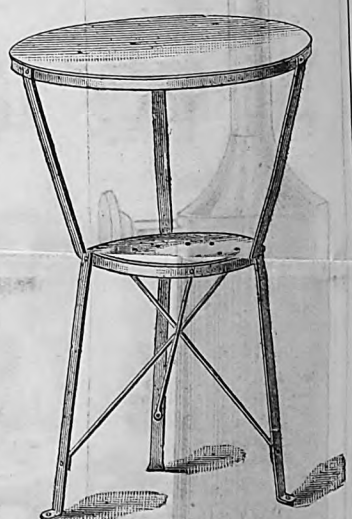
REGISTERED DESIGN No. 150.028.

The Chair is exceptionally comfortable.

No. 400.—Wood Seat, Varnished 3/6 each.
No. 401.—Wire Bottom .. .. 3/6 „



No. 402.—Wood Seat .. .. 2/3 each.
No. 403.—Wire „ .. .. 2/3 „



No. 404.—Wood Top .. .. 4/6 each.
No. 405.—Wire „ .. .. 4/6 „

Samples on View at London Export Office, 118 Cannon Street.

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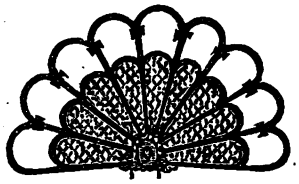
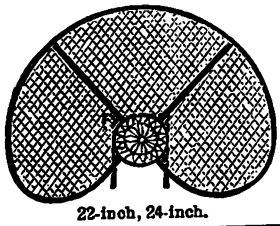
THOMAS'S FIRE-GUARDS.

SEASON 1890.

BRASS TUBE FRAME GUARDS
With Brass Corrugated Wire Lattice.
No. 308.



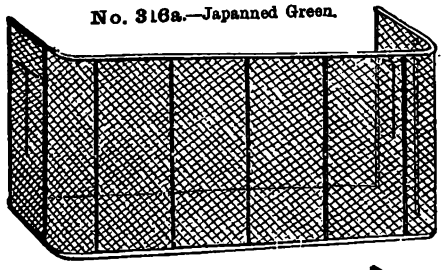
26-inch, 28-inch, 30-inch.
No. 844.



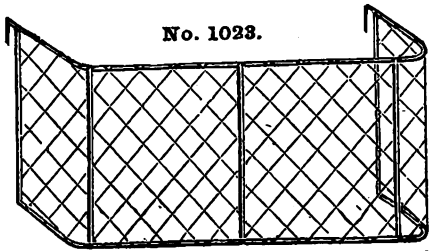
22-inch, 24-inch.

Brass Curbs. Brass Fenders.
Wrought-iron Guards for Asylums, &c.

CHEAP NURSERY GUARDS
With Brass Tops and Sheet-Iron Bottoms.
No. 316a.—Japanned Green.

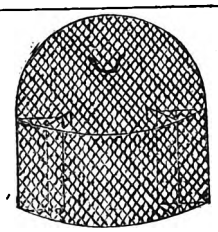


No. 1023.



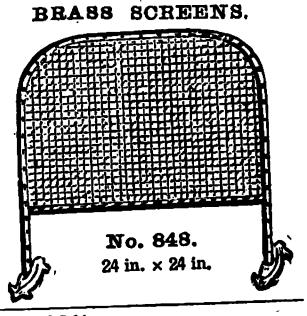
The Cheapest and Most Useful Article of the kind in the Market. 2 ft. 3 in. high. Made of Strong Corrugated Diamond Lattice.
1-INCH MESH ON A $\frac{5}{16}$-INCH ROD FRAME.
Painted Green. In Nests of Five Sizes, 3 ft. to 4 ft. long.

FIRE GUARDS.



No. 301.
$\frac{3}{8}$-inch Mesh.
Japanned Blue. Tinned Wire.
Brass Wire Lacquered.
Brass Wire with Bead all round.
Brass Wire with Moulding all round.

BRASS SCREENS.



No. 848.
24 in. × 24 in.

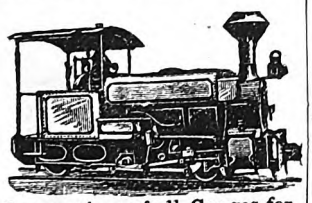
ILLUSTRATED LISTS WITH TRADE TERMS ON APPLICATION.

J. J. THOMAS & CO., Paddington Iron and Wire Works, 360 & 362 Edgware Road, LONDON.

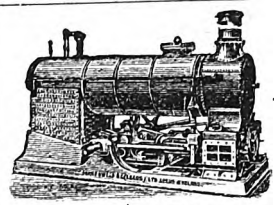
JOHN FOWLER & CO. (LEEDS), LTD., ENGINEERS,

STEAM PLOUGH WORKS, LEEDS, ENGLAND.

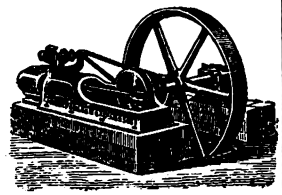
ENGINES SPECIALLY CONSTRUCTED AND FITTED FOR ELECTRIC LIGHTING.



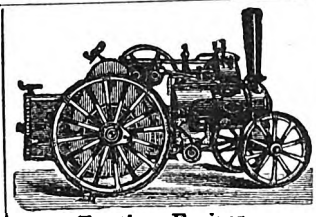
Locomotives of all Gauges for Portable Railways, Collieries, Contractors, &c.



Compound Semi-fixed Engines, for Hauling, Winding. Electric Lighting, &c.



Compound and Single Cylinder Horizontal Engines, for all purposes.



Traction Engines, for Thrashing, Sawing, Pumping Hauling, &c.

AWARDS
Gold Medal, Society of Arts.
Do., Inventions Exhibition.
First Medal Royal Agricultural Society.
Watt Medal, Royal Cornwall Polytechnic.

ADVANTAGES.
PERFECT SAFETY.
Can be worked by unskilled persons.
GREAT ECONOMY.

FOR
Pumping Water for Villages, Public Institutions, Mansions, &c., &c., &c.

FOR
Working Farm Machinery, Printing Machinery, and all purposes requiring Small Power.

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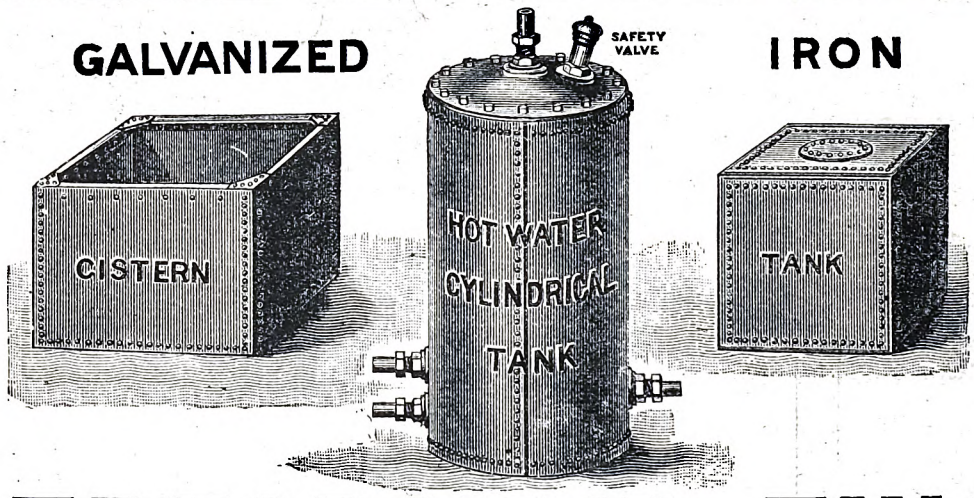
BRABY'S

352 to 362 EUSTON ROAD ... LONDON.
6 and 8 HATTON GARDEN ... LIVERPOOL.
PETERSHILL ROAD ... ... GLASGOW.

GALVANIZED IRON



PERFORATED ZINC.

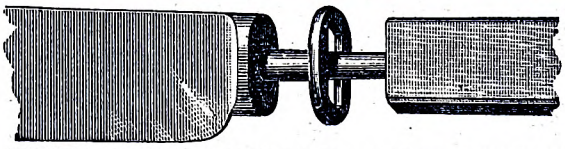
GALVANIZED CORRUGATED IRON SHEETS.

TELEGRAPHIC ADDRESS—"COURTEOUS LONDON."

The HOLDFAST

TRADE MARK.

"The Rim of German Silver is Brazed to the Shoulder, forming a Socket, into which the Handle is firmly fixed."



(WINGFIELD'S PATENT.)

THE ADVANTAGES IN THE CONSTRUCTION OF THIS CUTLERY ARE:—

1st.—The Handles cannot shrink from the blade shoulder, leaving an unsightly gap, so objectionable in appearance, and tending to weaken that part of the knife subject to greatest pressure.

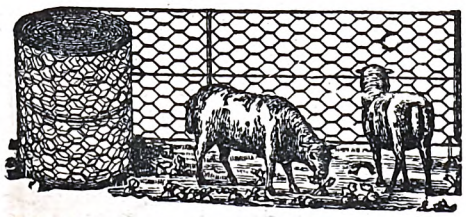
2nd.—The handle is more secure, being sunk into the shoulder as shown above.

3rd.—The shoulder can be easily cleaned and will not show rust, as in iron or steel shoulders.

WINGFIELD, ROWBOTHAM & CO., SHEFFIELD.

RICHARD JOHNSON, CLAPHAM & MORRIS,

MANCHESTER.



4-inch Sheep Netting, Selvage 3-ply and Centre Strand.

WIRE NETTING.

ALL KINDS OF

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MINERS' LAMPS.

PAPER MACHINE WIRES. WIRE CORDS.

Netting Staples, Malt Kiln Floors.

IRON, TINPLATE, WIRE, AND METAL MERCHANTS.

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